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A

TREATISE

UPON

PLANTING,

GARDENING,

AND THE

MANAGEMENT OF THE HOT-HOUSE.

CONTAINING

I. The Method of planting Forest-Trees in gravelly, poor, mountainous, and heath Lands; and for raising the Plants in the Seed-Bed, previous to their being planted.

II. The Method of Pruning Forest-Trees, and how to improve Plantations that have been neglected.

III. On the Soils most proper for the different Kinds of Forest-trees.

IV. The Management of Vines; their Cultivation upon Fire-Walls and in the Hot-House; with a new Method of dressing, planting, and preparing the Ground.

V. A new and easy Method to propagate Pine Plants, so as to gain Half a Year in their Growth; with a sure Method of destroying the Insect so destructive to Pines.

VI. The best Method to raise Mushrooms without Spawn, by which the Table may be plentifully supplied every Day in the Year.

VII. An improved Method of cultivating Asparagus.

VIII. The best Method to cultivate Field Cabbages, Carrots, and Turnips for feeding of Cattle.

IX. A new Method of managing all Kinds of Fruit-Trees, viz. of proper Soils for planting, of pruning and dressing them; with a Receipt to prevent Blights, and cure them when blighted.

BY JOHN KENNEDY,
GARDENER TO SIR THOMAS GASCOIGNE, BART.

THE SECOND EDITION,
CORRECTED AND GREATLY ENLARGED.

IN TWO VOLUMES.

VOL. I.

LONDON:
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M DCC LXXVII.

A
TREATISE
UPON
PLANTING
GARDENING,
AND
MANAGEMENT OF THE HOT-HOUSE.
CONTAINING

BY JOHN KENNEDY.

CORRECTED AND COMPLETE EDITION.

IN TWO VOLUMES.

VOL. I.

LONDON:

TO

Sir THOMAS GASCOIGNE, Bart.

THE fruits of my labours, whatever they may be, belong to you: your goodneſs and generoſity have already greatly over-paid them; yet I never durſt have petitioned for your patronage and protection for theſe Sheets, which I preſume to offer to the public, but from a perfect conviction of their utility: being ſufficiently acquainted with your knowledge in my profeſſion, and more ſo with the rigour with which you would treat the errors of

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your own ſervant when they regarded the public.

I have the honour to be, with the utmoſt reſpect and gratitude,

SIR,

Your dutiful ſervant,

JOHN KENNEDY.

PREFACE.

A Second Publication of this Work affords the Author the pleaſing taſk of returning thanks to the Public for the favorable reception it has met with, which gives him great pleaſure and ſatisfaction.

He thinks himſelf obliged, in a particular manner, to thoſe Gentlemen who have honored him with letters of approbation of his Work, many of whom have generouſly confeſſed the ſingular advantage their Pineries have received by applying his preparation for deſtroying thoſe inſects ſo pernicious and deſtructive to the Ananas or Pine-Apple, which it has effectually completed.

Many purchaſers of the firſt edition of this work, as well as his friends,

having requeſted him to publiſh his thoughts upon the Management and Pruning of Fruit-trees in general, aſſuring him that it would prove a valuable addition to this work.

In compliance with their flattering requeſt he has ventured to lay before the Public a courſe of many years practice, which he has followed with the greateſt ſucceſs.

The many publications on Gardening and Planting, which have been offered of late years to the Public, might have diſcouraged the Author of this Treatiſe from the preſent attempt; but as moſt of thoſe that have fallen in his way treat the ſubject in too general and ſpeculative a method to be of ſervice to practitioners, his intention in the following ſheets is not to deliver himſelf ſyſtematically, but, in the moſt explicit manner, to

lay before the Public facts that have been ſucceſsfully reduced to practice by himſelf.

Each particular ſubject he means to treat of, he will take up from the beginning, and to give the moſt minute directions as to the method of culture, labour, and management; together with the ſeaſons that each particular work is to be performed in.

The planting of poor waſtes, moorlands, and apparent barren mountains, has been but ſeldom treated of, and in very few places attempted.

The ſucceſs the Author has had in planting ſuch grounds, even in the north of Scotland, has induced him to treat that ſubject rather largely; and he flatters himſelf that, if his directions are followed, extenſive tracts of land which are now uſeleſs, may become ornamental and profitable.

A general ſyſtem of Gardening not being the intention of this Treatiſe, the Author will confine himſelf to the management of Fruit-trees in general, of Vines, Ananas or Pine-Apple, Aſparagus, and a new method of raiſing Muſhrooms without ſpawn.

His method of managing the different Soils proper for Borders, for Planting Fruit-trees, and of Pruning them, if not the beſt, has at leaſt the merit of being ſo new, that it differs entirely from any thing he has ſeen, both as to theory and practice.

The management of Fruit-trees has been treated at large by moſt of the eminent writers on the ſubject of Gardening. The Author has read them with attention, and while he ſees great objections to all their plans, finds leſs reaſon to attach himſelf to any one of them, as there are hardly

two

two writers of one opinion; but it is his buſineſs to endeavour to be as accurate as poſſible himſelf, and not to criticize on the defects of others.

He would not however have it underſtood, that by reading this treatiſe every perſon who can diſtinguiſh a peach from a pear, will be able to undertake the management of Fruit-trees, &c. for if books could make proficients, there would be no occaſion for maſters in any art or branch whatever.

Neither ſhould any one attempt to plant or prune without having been ſome time under a ſkilful perſon, whoſe practical inſtruction being added to a careful obſervation of the rules here given, cannot fail of ſucceeding to the utmoſt expectation of thoſe who follow them, which is the moſt ardent wiſh of the Author.

The

The directions given on thoſe heads being very different from the general practice, may perhaps make ſome rather diffident in following them; but the Author avers that they are what he has followed with the greateſt ſucceſs for many years.

Agriculture being now the object of general attention, the Author has added to this Treatiſe the cultivation of Field-Cabbages and Carrots, induced thereto by the great crops he has himſelf raiſed, and the great advantage they are in feeding of cattle, &c.

The growing of Turnips too is become an object of the greateſt conſequence for feeding of Cattle; the Author, therefore, has from many accurate obſervations added a chapter on their cultivation; his method has been followed by many who have raiſed them with

with the greateſt ſucceſs for years in different parts of England. The great waſte every year, occaſioned by their rotting (and the larger they are the more they are liable to it) muſt be a conſiderable loſs to the grower, which may be avoided in a great meaſure by pulling and houſing them, eſpecially the large ones, in dry weather, which, from repeated trials he is warranted to ſay, will effectually preſerve them.

The inſtructions given in this Treatiſe upon Planting, Gardening, and rural Oeconomy, are the reſult of many years experience; and the approbation his labours have met with is a very ample reward to the Author.

CON-

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A

TREATISE

ON

PLANTING

AND

GARDENING.

CHAP. I.

The Method of raiſing wood on rocky, hilly, waſte, and heath lands.

THE extenſive tracts of rocky, waſte, and heath lands in this kingdom, if converted into plantations of thriving trees, would prove a certain benefit to poſterity, as well as a pleaſing reflection to thoſe who are at the expence of performing ſo great and good a work. To aſſiſt the generous planter in

his patriotic deſign, is the intention of this firſt chapter. I ſhall ſuppoſe the tract of country, now in view, to conſiſt of rocky, hilly, and heath land, with little or no ſoil. Such unpromiſing ground may be covered with wood in the following manner.

THE labourers ſhould be provided with light ax-hoes, broad at one end and narrow at the other. With the broad end pare off the graſs or heath as thin as poſſible; then with the narrow end ſtir the ground to four or five inches, if you can; picking out ſuch ſmall ſtones as are looſened by the hack in ſtirring the ground, always avoiding large ſtones; but where theſe, or pieces of rock intervene, at three feet diſtance from the rock make as many places round as you can, for no ground ſhould be loſt; and although the trees are near on one ſide, they will have ſufficient air to grow to maturity.

THIS work ſhould be done in ſummer, that

that the places looſened may have the advantage of the firſt rains in autumn to moiſten them; for there is no planting in ſuch grounds until they are moiſtened after ſtirring, as all rain runs off before the ſurface is broke.

THERE is nothing more to be done until the planting-ſeaſon, which ſhould be as early as the weather will permit; for if done late, a dry ſpring would be of bad conſequence.

WHEN you begin to plant, take up no more trees at a time than can be planted in one day, taking care not to expoſe the roots to the ſun or wind.

THE beſt method is to ſow and plant the trees alternately. So when you plant, the places for ſeed ſhould be left until the ſeaſon for ſowing in ſpring.

THE trees fit for planting in ſuch places are, at the ſummit of hills, Scotch firs and

larches. This is the proper ſituation for larch, it being an inhabitant of high and cold places. A great reaſon for its growing crooked, is its being planted in low ſituations and good land, where it grows too faſt, and is not able to ſupport its large head.

THE weſt, north, and north-eaſt aſpects ſhould be planted with Scotch fir and larch; and towards the bottom of the hill, in the ſame aſpects, beech will thrive. If there are ſix inches of ſoil, ſown or planted oaks will grow very well; and though the ſoil be poor, clumps of ſycamore for ornament will grow beyond expectation; as they will receive the moiſture from the higher grounds. This may be ſeen in natural woods.

THE other aſpects ſhould be planted with beech, hornbeam, ſycamore, and all the bottom with oaks: if three or four mountain aſhes are planted in different places, it will add to the beauty of the

the plantation; but the wood is of little value.

The common wood, or rough-leaved Elm, will grow in a very poor ſoil to great perfection, and may be planted next to the Beech. Theſe muſt be planted very thick. There are many firs and pines brought from America that thrive in poor land. Of theſe there have been no large plantations made; what have been planted are for ornament, and the wood of them does not ſeem to differ much from the Scotch, which we are ſure comes to a great ſize in a very poor ſoil, and at a diſtance they have much the ſame appearance. The beauty of ſuch plantations is only to be ſeen from diſtant views. The ſeeds of the ſame ſort of trees ſhould be ſown in every other place left vacant in planting. At the top, where the Scotch firs and larches are planted, there ſhould be no places left, as theſe trees are of a very quick growth, and the ſeeds of the fir kinds are ſubject to be

devoured by birds. The young plants alſo, for the firſt year, are very ſubject to be thrown out of the ground by froſt. And, what is more material, they would be ſmothered by thoſe planted, if they ſhould meet with no miſchance.

In ſowing, you may put ſome acorns amongſt the planted beech, as they are near of a growth. They will grow from ſeed where they will not thrive when planted, and, penetrating into the cavities with their young fibrous roots, will find ſufficient nouriſhment where there is little appearance of a tree's growing. In natural woods we often ſee fine oaks in ſuch ſituations, and there is no doubt ſuch trees were from ſeeds accidentally dropt.

It ſhould be obſerved, that all trees thrive better in clumps than when mixed. If mixed, they ſhould be with trees of an equal growth, which is ſeldom conſidered. It has been a common practice to mix Scotch firs with oak and beech (the

Scotch

Scotch fir is of a very quick growth for ten years, the oak and beech of a very ſlow growth for near that time) to keep them warm and to encourage their growth. The practice is very wrong, and quite contrary to the preſent ſyſtem of thick planting. If the firs are planted at ſix feet diſtance, with an oak between, they will ſmother the oaks in a few years; and if taken away ſooner, they do not anſwer the end they were planted for. If the oaks are planted alone at three feet diſtance, they will thrive much better, for they ſuffer more from the cold when the firs are taken away, than any advantage they can receive from their warmth while they remain. When the firs are taken away your oaks ſtand at ſix feet diſtance, which is too much, as the intention of planting thick is fruſtrated, which is to prevent pruning and to keep the trees warm, both which are of the greateſt conſequence to plantations on poor land.

WHERE there is ſo much rock, and in-

deed no appearance of earth, there is no poſſibility of ſtirring the earth with a hack; yet we muſt not deſpair of raiſing trees and ſhrubs, which is evident to be ſeen in natural woods where trees and ſhurbs are ſeemingly growing out of the ſtone. No art can pretend to plant in ſuch places; but nature ſhews us what ſhe can do, and by following her dictates we may accompliſh what has been thought impoſſible.

In all rocks there are openings and cavities, and by the moiſture falling from the higher parts of the rock into the bottom of the openings, there is ſufficient nouriſhment to vegetate ſeeds; and when they are once in a growing ſtate, the young roots will find cavities and openings to puſh into, and alſo nouriſhment ſufficient to make a tree, buſh, or ſhrub. It cannot be ſo certain to get trees and ſhrubs to grow in rocks as in earth; but it may be depended on that many will grow, and to a great ſize. The only method is to drop ſeeds into the cavities.

THE beſt ſeaſon for dropping ſeeds into rocks is as ſoon as they are full ripe and dry; but there are ſo many mice and other vermin about ſuch places in winter, not overſtocked with proviſion, that they deſtroy every thing within their reach. To remedy this as much as poſſible, the ſeeds may be ſo prepared as to be ſown or dropped in March with good ſucceſs.

THE preparation of the ſeeds for dropping amongſt rocks, and ſowing plantations on all kinds of poor land, will be treated of under that head.

IN order to drop the ſeeds amongſt rocks, let a man take a few of the following ſeeds, and drop three or four of a kind into each cavity, obſerving to drop the larger ſeeds into the deepeſt cavities, ſuch as acorns, beech-maſt, hornbeam, evergreen oaks, yews, mountain aſh, hollies, haws; and, into the leſſer openings, broom, juniper, furze, birch, and wood elm.

THESE

These places ſhould be gone over the following ſpring, as there are many accidents to prevent the growing of the ſeeds. There will be no occaſion to have any regard to drop the ſame ſorts of ſeeds into the holes as they were dropped the ſpring before; for if both grow, it will be of no bad conſequence, as we often ſee two trees of different kinds growing in natural woods on bare rocks.

It may ſeem ridiculous to drop ſeeds into rocks; but it is evident, that many fine trees are growing in ſuch places, and it muſt have been occaſioned from ſeed accidentally dropping. This is no more than following nature, and ſhe has taught us what is to be done to cover ſuch places as have been left naked and diſagreeable.

It may be objected, that there are many trees in natural woods, on rocks, that produce ſeed, and yet there are many bare places on the ſame rocks. But it may be remarked, that many of the ſeed falling

falling into one cavity may intice vermin to deſtroy the whole, and many places where none fall. The ſmall quantity that is dropped into each place is no great temptation to vermin, and the regular dropping prevents any being miſſed.

I MUST here be underſtood as ſpeaking of ſuch places where there is very little earth, and of bare rocks where there appears to be no earth, and where it ſeems almoſt impoſſible for any thing to grow, and where the ſpade could be of no ſervice. But I am certain, if the directions given are followed, a fine foreſt will ſucceed a barren mountain, which will be a great pleaſure to the preſent poſſeſſor, a profit to poſterity, and an advantage to the kingdom in general.

HAVING given directions for planting the barren mountain where there is little ſoil, I ſhall now take into conſideration gravelly hills, heaths, and commons, where there is ſo much earth that little holes may be made to plant and ſow in.

MAKE the holes at three feet diſtance as deep as the ſoil will allow, and one foot broad, if the ground is not very ſtony at top. The readieſt method is to pare off the ſurface with a paring ſpade; but if ſtony, the broad end of the ax-hole will be the beſt. If graſs, pare it off as thin as poſſible, lay it aſide, dig out the earth, and lay the pared ſurface into the bottom, laying in the earth in the form of a mole-hill, to remain until the ſeaſon for planting and ſowing. This work ſhould be performed early in ſummer for the rains to moiſten the earth, which is always very dry when turned up, and there is no danger of weeds growing on ſuch land. The earth being laid up round will have more advantage of being mellowed by the weather; and when the planting ſeaſon comes, there is nothing to do but to level the ground even with the ſurface and plant.

A MAN can make three hundred holes in a day, and two men may plant a thouſand, and do them well.

IF

If the ſurface be coarſe, benty graſs or ſhort heath, which is often the caſe in ſuch poor land, pare it off with the hoe as thin as poſſible, and throw it away. The paring ſpade ſhould not be uſed, as it takes too much of the ſcanty ſoil: for in ſuch dry ground any thing that is light keeps it open, and is of very bad conſequence by making the ground lighter and drier.

The holes being laid in this poſition, will be in good condition to plant after the firſt autumn rains, for moſt kinds of deciduous trees. They ſhould be planted as ſoon as the leaf is decayed. They may be planted in open weather the beginning of winter, but never in the ſpring on ſuch dry ground.

Oak and larch are an exception to the general rule; for although they are deciduous plants, their proper time of planting is late in ſpring.

Oak thrives beſt when it is removed in the ſpring, juſt before the bud begins to puſh; that is, about the beginning of March. This ſhould always be obſerved in the removing of them that have been trained in the nurſery for four or five years, as in a great meaſure ſucceſs depends on their being removed at a proper time. I have planted oaks of ſix and eight feet high, the latter end of April with good ſucceſs, but it was into a fine ſtrong loamy ſoil.

The young plants of oaks that are intended for bare ground ſhould be planted at the ſame time with the trees from the nurſery; but if there is the appearance of a dry ſpring, they muſt be planted before the ground is dry, or they will infallibly periſh.

As it is beſt to plant all kinds of trees by themſelves, it can be no inconvenience to leave the ground deſigned for oaks until the proper ſeaſon. This will be an advan-

vantage; as the other ſorts of trees ſhould be planted ſooner, there will be more time to finiſh planting.

If there are any ſmall crooked oaks in the nurſery, and ſeemingly good for little, prune their ſtems, and plant them by themſelves; and after they have been planted two years, in any of the winter months cut them down an inch below the ground, and they will make fine ſtraight ſhoots next ſummer. In the latter end of June, or beginning of July, let them be gone through, and all the ſhoots but one of the ſtraighteſt and ſtrongeſt be ſliped off with the finger and thumb, cloſing the earth round the remaining plant; they will come eaſily off at that ſeaſon, but if they ſtand much longer, we ſhall be in danger of tearing the bark off the ſtool, which would ſpoil the tree. There muſt be no knife made uſe of; for if cut, they will puſh many ſhoots at every amputation, which would much injure the trees, as they muſt be cut again, and

by

by that means will form a bunch round the root of the tree, which would be very detrimental, if not wholely deſtroy it. It will be neceſſary the next ſummer to go over them at the ſame ſeaſon, and ſtrip off any ſmall ſhoots that may have ſprung, after which no further care will be wanted. This is foreign to what I propoſed treating of; but I have ſeen ſuch oak plants thrown away as good for nothing. I have planted ſuch, and treated them as here directed, and have had a clump of fine trees, ſtraighter and finer than thoſe planted with their heads. It is my opinion, that all planted oaks which do not thrive, if they were cut down as above, would make fine trees. I have done ſo with ſome, and they anſwered very well.

THE larch, although a deciduous tree, ſhould never be planted in winter, and in moſt autumns it is too late before it loſes its leaf. The beſt ſeaſon then is the beginning of March, both for large and ſmall trees. They ſhould be planted juſt before

before the buds begin to push. It is a resinous tree, although not an evergreen, and has small fibrous roots like all kinds of firs and pines, whose roots should never be cut, unless they have been long out of the ground.

None of those trees should be planted when the wind is high, nor when the air is frosty; their strong roots being hard and brittle: the small roots, if dried by frost or wind, never recover, and it is from those small roots the tree is first put in a growing state: this often occasions the loss of the tree, as the large roots are so hard, that they seldom push until the tree is growing. Young larches have only small roots, and require no cutting if planted soon after taken up. If the small roots are dried, it is of bad consequence, and is the reason they so often miscarry when kept long out of the ground. All kinds of resinous plants should have their roots wrapped in wet moss, if they are to be carried to any distance.

All kinds of pines and firs ſhould be planted early in autumn or in the ſpring; the latter is preferable, as early in autumn the ground is generally too dry, and after the rains have fallen, it will be too late, as the froſts may be expected ſoon; and ſhould they be very ſevere, it will throw the young trees out of the ground.

The Scotch firs are an exception to the general rule, for they may be planted with ſafety from September to April; but in poor land that is hard and dry, it would be of great ſervice to put ſome graſs, ſtubble, or any light ſtuff round them, to keep out the froſt, as they are ſubject to be thrown out of the ground as the other kinds.

It ſhould be obſerved, that firs ought never to be planted in ſuch dry ground, as here treated of, when very dry; neither ſhould they be planted when the ground is very wet. Two days after rain, it will be in good condition, that is,

in

in high ground; but there are ſome very poor lands that are ſo flat, that the water has no way to run off. Such places ſhould be planted in ſpring.

ALTHOUGH the ground in general be very poor, yet in thoſe places where the water lies, it is richer, and generally of a ſtrongiſh loam, although ſhallow, and a clayey bottom. If the water can be drained off, ſo that the ground remains only wettiſh, and not to ſtand to cover the ſurface, oak will thrive well in ſuch places, and grow faſter than in any other ground. I have had them ſhoot three feet in one year, being the ſecond after planting, and very ſtraight and ſtrong, although the whole ground was ſeveral times covered with water the firſt winter after being planted.

WHEN ſuch places are planted, the holes muſt not be made but as you plant; for if the holes were to be made as before directed, the bottoms would be full of

water, the tree would ſtand in a quag-mire, and it would be impoſſible to faſten it. If the tree is planted ſix inches above the level of the ſurface, it will be better, and the ground made up, round the tree, in the form of a round-topp'd muſh-room.

In theſe places we muſt deviate from the general rule for planting poor land. The trees planted here muſt be ſuch as have been trained in the nurſery for four or five years, and of a pretty good growth. The reaſon is, that the ſmall fibres of young trees are eaſily rooted; therefore, ſuch trees as are planted in this ground, muſt have all their ſmall roots pruned off. The ſtrong roots will bear the moiſture, and puſh freſh roots ſooner than in any other ground. It will be abſolutely neceſſary to plant ſuch places in ſpring, and it may be performed ten days later than in any other grounds, for there will be ſufficient moiſture for them all the ſummer.

THERE muſt be no places left for ſowing here; for the moiſture would rot the ſeeds. Spruce-fir, and the ſwamp-pine will thrive well in ſuch places; and the plane tree will grow, if there is a foot deep of ſoil. Every one of the poplar kind will do very well; but I think they ſhould all give place to the oak, which will thrive to admiration.

POPLARS of all kinds have come into great eſteem of late years, being found very fit for every ſort of country buſineſs. Several gentlemen have made chamber-floors of them, which anſwer very well; but they will not be of long duration.

As wood is ſcarce in many places, a ſmall place might be allotted for a plantation of poplars; and as they are of a quick growth, they will come to uſe in a few years, and ſave better wood. They will grow in any land that is not very hard and dry; but as the intention of planting them is, that they may ſoon become pro-

ſitable, it is adviſeable to plant them in a ſwampy rich ſoil.

THE beſt method to propagate them is to cut them into truncheons of a yard long, and with an iron bar let them into the ground level with the ſurface, faſtening the ground round them. They will puſh out many ſhoots the following ſummer, which ſhould be all pulled off by the hand the end of June, or ſoon in July; only one of the ſtraighteſt and ſtrongeſt ſhould be left to grow to a tree. There will be more ſhoots puſhed out in the ſummer, which ſhould alſo be pulled off as before (for they are very ſubject to puſh out ſuckers) after which they require no further care; for if they are planted at ſix feet diſtance, they will prune themſelves, and grow very ſtraight, and to a great ſize in thirty years.

SOME ſharpen them like a ſtake, and drive them down with a mallet, but that is not a good method; for if in driving, they

they are ſcratched by ſtones or roots, the bark decays on that ſide, and often cauſes a blemiſh in the tree, after it has grown ſeveral years. When the bark is not broke, they puſh roots all along the truncheon to the very ſurface, and make much finer trees than thoſe planted with roots; neither are they ſubject to be blown up, which the others are.

In plantations where under-wood is deſigned, ſome clumps of poplars will anſwer extremely well; if the ground is inclined to wet, they will be fit for cutting much ſooner than any other wood; therefore they ſhould be kept by themſelves.

The ſowing tree-ſeeds by the plow has been ſome time in practice, and is certainly a good ſcheme; but to uſe the plow in poor gravelly land, that is covered with ſhort heath, and has never been in tillage, will anſwer no end; or if the field or common be rough with coarſe graſs, and little ſoil, it will coſt ten times

the expence to bring it into order for ſowing or planting, than making the holes for planting as before directed; and the trees will thrive much better than when the coarſe graſs and heath are plowed in, unleſs the ground is worked until they are quite rotten, which would require a good deal of labour and expence to no purpoſe.

WHERE there is poor land, that has growed corn for ſome years, and is deſigned for planting, plowing will be of great uſe, and a very profitable way of working it; the field may, at a ſmall expence, be put into good condition, which will promote the growth, ſuccour and encourage the trees for many years, even until their own foliage becomes a manure to them; and a crop of underwood my be expected.

PLOW the ground in autumn immediately as ſoon as the corn is off, and let it ly all the winter to mellow; plow it again

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in the ſpring, as ſoon as the ground is in condition; and a third plowing is neceſſary in order to ſow turnip or rape ſeed, which ſhould be ſown as early as poſſible, and very thick. When it is grown ſluſh, that is, juſt before the plants begin to ſhoot (for they will all ſhoot that are thus ſown ſo early and thick) feed them off with ſheep; as ſoon as they have ate them quite bare, plow the ground a fourth time; and if many weeds ſhould grow, which is hardly to be expected in poor gravelly land, plow it again juſt before winter. When it is dry, let it ly all the winter rough until ſpring.

The middle of April is the proper time for ſowing the prepared ſeeds; but if they are ſown without any preparation, they ſhould be ſown the beginning of March. Early in the Spring there is always a great hurry of buſineſs; it will, therefore, be a great relief to have a week more to perform the ſame work; and, beſides other advantages, this is a very

very eſſential one for preferring the prepared ſeed.

JUST before you intend to ſow, plow and harrow the ground; and if the field is ſo large as to take ſeveral days work, plow no more than you can finiſh in a day.

THE ground being plowed and harrowed, mix beech-maſt, aſh-keys (the aſh-keys ſhould be buried a year in a pit, mixed with ſifted coal-aſhes, as they never come up the firſt year) ſycamore, hornbeam, common black cherries, Spaniſh cheſnut, maple, and acorns, and ſow them broad-caſt all over the field; then plow the field with a very ſhallow furrow three inches, and ſcatter ſome birch and rough-leaved elm-ſeed all over it.

THE proper timber-trees for ſuch land, with underwood, are oak, beech, and Spaniſh cheſnuts, which are all much of a growth;

a growth; and although this is not the proper ſoil for the oak, it will anſwer very well when ſown. Notwithſtanding there are all thoſe kinds of ſeeds ſown in the broad-caſt way, and covered by the plow, it would not be amiſs, at thirty feet diſtance, to plant three of the timber-tree ſeeds in a triangle of ſix inches diſtance, and then there will be a certainty of having the trees, which are to grow to timber, at a regular diſtance (which might be marked as the labour would not be much) and room for the underwood to grow ſo as never to be over-topp'd by the timber-trees. The whole ſhould then have a ſingle ſtroke with a buſh-harrow.

If any large weeds, ſuch as thiſtles, docks, or wild muſtard, ſhould grow, they ſhould be pulled by the hand when young; as for ſmall weeds, they will be of ſervice in winter, to prevent the froſts throwing the ſeedlings out of the ground, and will not grow in ſummer to be any ways detrimental to the plants; beſides, they

they will keep out the drought, which will be of great uſe in ſuch ground.

THE trees deſigned for timber ſhould have nothing of the tree kind grow nearer them at firſt than three feet; and the third year after ſowing, there ſhould be only one plant left in a place.

THE whole ground ſhould be gone over the third year, and all the plants that are for underwood, and nearer than a foot, ſhould be drawn up, and the ground faſtened round the remaining plants.

As there will be a number of young plants drawn, they ſhould be planted in a nurſery prepared for them in tolerable good land, and trained for ſome years to plant in good ground.

ALL kinds of firs and pines muſt not have any place where underwood is intended; if allowed to grow ſcattered about the field, they ſpread a vaſt way,

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and by the cloſeneſs of their branches will deſtroy every thing under them; and if they are cut down after they are grown to a conſiderable ſize, they make a large gap.

THIS is the only method to get underwood in poor gravelly land. It will be long after ſowing, before it is fit for uſe; but after it has been cut the firſt time, it will grow better every cutting, and laſt many years.

GROUND thus managed with the plow would make a fine wood, ſown after the following manner. Make the holes at three feet diſtance; put three or four ſeeds in a hole, at four inches diſtance, in form of a ſquare. To the weſt, north-weſt, north, north-eaſt, and eaſt, make a ſkirting of Scotch firs, and another of larches in the ſame aſpects; then beech, Spaniſh cheſnuts, and acorns. The ſeedlings may grow to the ſecond year, when they ſhould be drawn, except two of the beſt plants. Then the third year, the beſt ſhould be left, and the others taken away.

THERE muſt neither be ſpade nor fork uſed in taking up the ſupernumerary trees; for if the roots of the trees that are to remain are diſturbed, it will greatly hinder their growth. If a proper ſeaſon is obſerved, they will draw eaſily. After a very hard froſt, when the ground is thoroughly thawed, they will draw with the hand. When the plants are all drawn, faſten the ground round the plant that remains, with your foot. The plants taken up in this, and all ſown plantations on poor land, muſt be carried to the nurſery.

A POOR cold clay, that has been in corn, and is of no great value for that purpoſe, will anſwer to make a plantation with underwood. It will not be very vigorous for ſome years; but after the roots have got good hold of the ground, it will ſhoot in faſt, and laſt many years.

OAK is the only timber-tree to be encouraged in ſuch a ſoil. Its progreſs will be

be ſlow, but it makes fine wood. The acorns ſhould be ſown four in a place, at ſix inches diſtance from each other; and the places ſhould not be nearer than thirty feet, to allow room for the under-wood.

Ash, poplars of all kinds, tree ſallow, and birch are the proper underwood to be planted and ſown in ſuch land. The poplars and ſallows, for planting in clay, ſhould be cut eighteen inches long. As the clay is hard and dry, there will be little moiſture to encourage their ſtriking roots at a greater depth, therefore they ſhould be let down, as before directed, in making plantations of them.

The ground ſhould be plowed early in autumn, as deep as the plow can go, with a thin furrow, and ly all winter to mellow.

The poplars and ſallows may be planted any time in winter, and the ſeeds ſown in the middle of April. This land muſt

not

not be plowed in the ſpring, as it would be too ſtiff for the ſeeds to vegetate in at firſt.

THE acorns being planted at their proper diſtances, as alſo the ſallows and poplars, let aſh, birch, and rough-leaved elm-ſeed be ſown all over the field, and covered with a ſingle ſtroke of a buſh-harrow.

THE poplars and willows ſhould be planted at eight feet diſtance; but none of them ſhould be planted nearer the acorns that are to remain for timber-trees, than ten feet.

IN ſuch a plantation it would be very beneficial to prune the oaks for ten years, which would make them have fine ſtraight ſtems, and be of great value. Being planted at ſo great a diſtance, there would not be a great number in a large field, and the labour and expence would be trifling. Where underwood is intended, the timber

ber-trees ſhould never be nearer, for if they are, they will in a few years quite ſmother the under-wood, ſo as to render it of little value.

THERE is another advantage in pruning the Oaks; their ſtems being long, and their heads ſmall, the under-wood will thrive all around them as near as it ſhould be allowed to grow; which will not be the caſe if they are not pruned: they will then have ſhort ſtems and very large heads, and will deſtroy the under-wood for thirty feet round them.

IN countries ſcarce of firing, and where poles and rails are wanted, under-wood will pay the proprietor triple more value than the beſt fields of corn, even allowing for the expences of planting, fencing, and the rent of the land from its being planted to the firſt cutting, after which there is no labour but keeping up the fences; ſo that the profit will increaſe, and the Oaks for timber ſtill remain a great eſtate to ſucceeding generations.

CHAP. II.

On Sowing Tree-Seeds with Corn.

SOWING tree-ſeeds amongſt corn is an exceeding good method, for it prevents the vermin deſtroying the trees as they come out of the ground; moſt trees bring up the ſeed with the firſt leaf, and all birds are fond of them, and often deſtroy whole fields as they come up. This method ſhould not be attempted on fields that have been in graſs, but ſuch as have been in corn for ſome time.

IF it were rich deep land, it would be a very good method to have a crop of underwood; but bare poor land is our preſent ſubject, therefore I ſhall give proper directions for raiſing a field of good timber-trees on ſuch land.

THE

THE ground ſhould be plowed in autumn, and early in the ſpring ſown with a thin crop of oats. If the ſeeds are dry, and not prepared, they ſhould be ſown at the ſame time; but if prepared ſeeds are uſed, which are much preferable, the middle of April is the proper ſeaſon.

THE large ſeeds may be planted with a ſetting-ſtick, not too ſharp at the point, at three feet diſtance, three or four ſeeds in a place, at four inches apart and two inches deep.

THE rough-leaved Elm, Larches, Scotch Firs, Silver and Spruce Firs, and Pinaſters muſt not be planted with the ſetting-ſtick, but the ground hollowed out half an inch, and three or four ſeeds dropped into each place at four inches diſtance, and preſſed a little down with the hand, then covered with mould level.

THE proper ſeeds to be ſown, even in poor land, amongſt corn, are Oak, Beech,

Black Cherry, Spaniſh Cheſnut, Hornbeam, Silver and Spruce Firs, the Scotch Fir, Larches, and Pinaſter; and, if the ground is inclined to ſand, Sycamore, Horſe Cheſnut, and Limes may alſo be planted.

ALTHOUGH the ground is not the propereſt for all the trees here mentioned, the growing corn is of ſo great ſervice to them, that they will thrive beyond all expectation.

THERE ſhould be no tree-ſeeds ſown where the ſurface is not quite rotten. If any gentleman chooſes to be at the expence of paring and burning fields or commons that are in graſs or ſhort heath, let him ſow it with turnips, and let them be eat off with ſheep early in autumn, then plow it as deep as the ſoil will allow as ſoon as it is clear of the turnips. In the ſpring ſow it with a thin crop of oats, and with the tree-ſeeds at the proper ſeaſon;

March

March for the dry ſeeds, and the middle of April if they are prepared.

If the ground is free from large ſtones and tolerably even, ſo as to be eaſily plowed, the expence will not be great, eſpecially if the ſeaſon anſwers, the turnips will repay the expences; there can be no expectations of a great crop from ſuch poor land. It is for the advantage of the tree-ſeeds that I recommend this method of working.

All the Pine and Fir kinds of Trees do much better ſown amongſt corn than any other way; and indeed it is the beſt method of ſowing them, for the ſtubble is very beneficial to them, as it prevents, in a great meaſure, the froſt throwing them out of the ground, which all ſorts of Firs and Pines are ſubject to when ſown otherwiſe.

All the different kinds of trees ſhould be ſown ſeparate: the aſpects from the

ſouth-eaſt to the ſouth-weſt ſhould be ſown firſt. A ſkirting of Scotch Firs, forty feet broad, ſhould be ſown if the plantation is large; then another of Larches of the ſame breadth; and if all the other ſorts were ſown in the ſame form, the different ſhades would add greatly to its beauty.

THE reaſon for ſowing the Scotch Firs and Larches to the weſt, north, and eaſt points is, that as they are very hardy, and quick growers, they will be a great ſhelter to the other trees, and keep them from the cold winds that blow from thoſe quarters, which often bends them and makes them grow crooked.

WHEN the oats are cut, the labourers ſhould be particularly careful not to tread on the trees. The oats ſhould be cut high to prevent the ſeedling-plants from being topt; and the long ſtubble will keep the trees warm all the winter. The oats ſhould be carried off the field by men

as

as ſoon as they are cut, for it will be impoſſible to bring carts or horſes into the field without deſtroying many of the young plants.

TREES ſown amongſt corn will grow more the year they are ſown, than they will any other way in two, and be very ſtraight. I have had Oaks grow eight inches from the ſeed in one year in very poor land.

UNLESS there are thiſtles, or ſuch ſtrong-growing weeds (which ſhould be pulled up by the hand when young) there will be no occaſion to hoe or clean in ſuch grounds, for the ſtubble and ſmall weeds will be of great ſervice to keep out froſt and drought, which is of great importance to the young trees on ſuch dry ground.

THE young plants ſhould be thinned the ſecond and third years, as directed in the other ſown plantations; after which they

will require no further trouble for many years.

It may be imagined that *ſown* trees left at three feet diſtance would be ſo thick as never to grow to timber; in tolerably good ſoil it would be improper, but in poor gravelly and ſandy land they grow very ſlow for ſeveral years, and never begin to make any great progreſs until they ſhelter and keep one another warm; they alſo grow much ſtiffer and ſtronger in the ſtem, and their ſide-branches do not extend near ſo faſt as in good land; therefore their being ſown thick is a very great advantage, and the only method to make them thrive.

There is nothing further to be done until the plantation becomes quite a thicket, then every other tree muſt be ſtub-felled, and they will be fit for many uſes.

The trees to be taken away (as they will not be drawn weak on ſuch ground) may

may ſeem very good plants for tranſplanting; but that muſt not be attempted, as it will be impoſſible to take them up with any thing like a root for planting, without greatly hurting the roots of the trees that are to remain on the ground; it would greatly retard their growth, and the trees taken up would have little chance of growing, being taken out of ſo cloſe a ſituation; and it would be impoſſible to avoid cutting theſe roots very ſhort, as the trees are only three feet diſtance, with their roots ſpreading all over the ground.

ALL the plantations here treated of muſt be thinned in the ſame manner when they are grown up; then the trees will ſtand at ſix feet diſtance, which will be ſufficient room for them to grow to timber. After ſome trees are taken away, and the remaining ones are at ſix feet diſtance, their ſide-branches will ſtill near meet, and be ſufficiently warm; and they will decay as the trees advance in height, and by their cloſeneſs will prune themſelves.

It will be a great temptation to lovers of trees and planting, who have plantations going on, to thin their ſown plantations. When the trees are about ſix feet high they are then of a proper ſize and age, and would be very fit for tranſplanting into any ground that is tolerably good; but then, the plantations they were taken from being on poor land, they would never thrive, but ſtunt and grow crooked buſhes, as may be ſeen in natural woods on poor ground. Where the trees are thin they make no progreſs, whereas where they are very thick in the ſame wood and on the ſame ſoil they are very ſtraight and tall; for which reaſon no temptation muſt prevail to thin them at that age.

Where under-wood is of great value, and where there have been large plantations made on poor land, when they come to be about ſixteen feet high, if there was a hundred yards cut clean off by the ground, then a clump of trees to ſtand of the ſame ſize, and ſo on all over the plantation, this

would

would be profitable to the preſent proprietor and advantageous to the country; and as the trees ſtand in large clumps they will thrive very well, and the under-wood will grow very faſt after the firſt cutting.

CHAP.

CHAP. III.

On Planting Moors and Commons covered with long Heath.

THERE are large hills, moors, and commons covered with long heath; ſuch places are of more value than is generally imagined. The heath which grows on them plainly ſhews the ground is fertile, and if they had been planted ſome years ſince would have been fine foreſts, and not one ſprig of heath to be ſeen. It is the beſt ſoil for planting in England, and will bring trees to as great perfection as our beſt land, and with ſmall expence.

THIS ſoil, in appearance, is a light, black peat earth; but it is of a far ſuperior nature, for on that black, looſe, moſſy earth grows little heath, only a ſtrong benty graſs, and a little ſoft moſſy earth below the graſs, then a hard kind of peat, which

which is very barren; whereas that on which long heath grows is of a great depth, and of a fine moiſt clammy nature. On this ſoil moſt of all the kinds of foreſt-trees known in England will grow, even all the kinds of poplars, which ſhews that it is of a very fine moiſt nature.

THE planting or ſowing in ſuch ground is much eaſier performed than in the beſt land: there is nothing further requiſite than to pull up the heath about a foot's breadth, and if you ſow with the large tree-ſeeds, ſuch as Acorns, Spaniſh Cheſnuts, or Beech-Maſt, they may be planted with the ſetting-ſtick (as the pulling up of the heath has looſened the ground ſufficiently) two inches deep; four or five ſeeds in a hole, three inches apart.

WHERE the ſmaller ſeeds are ſown, ſuch as the Silver and Spruce Fir, the Scotch Fir, the Pinaſter, Weymouth Pine, and Larch Tree, after the heath is pulled up, chop the ground with a ſpade, and drop

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four or five ſeeds into the place, at three or four inches diſtance, then gently tread it with the foot; and nothing further is required in ſowing on ground where long heath grows.

Such ground requires leſs labour to plant than any other: there is no occaſion to make the holes until they are juſt going to be planted, and they need not be any larger than juſt to receive the tree roots.

The heath is of great advantage to the young trees, and makes them thrive exceedingly if it is higher than the trees planted, which I would adviſe. If the heath is eighteen inches or two feet high, the trees ſhould be a foot or thereabouts; the heath will then keep them warm, and will protect them from all winds until they have got good roots; ſo there will be no occaſion to plant ſo thick as on the poor bare land.

Six feet will be a proper diſtance; the trees will grow very faſt, and by the time they have got a foot or two above the heath their branches will near meet, and as the trees advance the heath will decay. The trees growing cloſer will prune themſelves, and there will be no further care requiſite.

If the ground is a flat moor, it ſhould be planted to the weſt, northern, and eaſt aſpects with Scotch Firs and Larches, as before directed upon poor land, for ſhelter.

If a hill or riſing ground, which is generally the caſe, the higheſt ground to the weſt and north ſhould alſo be planted with Scotch Firs and Larches, to ſhelter the other trees from the north winds; but the plantation of them ſhould be ſmall, as it would be bad policy to uſe much of this ground for any trees but the Oak, which thrive in ſuch ſoil better than in any other.

If ſuch riſing ground is in ſight of a gentleman's houſe, there may be ſome clumps of the different kinds of Firs and Pines planted for ornament, as they are very beautiful at a diſtance in the winter. The Silver and Spruce Firs will grow to an immenſe height in ſuch ſoil.

Although I have given directions for ſowing and planting the different kinds of foreſt-trees on ſuch ground, it is to ſhew that it may be planted and ſown with ſuch where gentlemen are inclined ſo to do; but as the Oak is by much the fineſt and moſt valuable wood, it ſhould have the preference, eſpecially on ground ſo proper for its growth.

I made three different plantations amongſt long heath (where the ground anſwered the deſcription given) in the ſame year. The firſt was ſown with Acorns and Scotch Fir-ſeed; the ſecond was planted with ſeedling Oaks a foot high, two years old, and Scotch Firs from the ſeed-bed of

that

that year's ſowing, but were thinned to two inches in the ſeed-bed, and were fine ſtiff plants; the third was planted with ſeedling oaks, three years old (eighteen inches high) but had not been removed from the ſeed-bed. The heath was near two feet high and very ſtrong.

In the firſt, ſown with Acorns and Scotch Fir-ſeed, many of them came up very well; but the mice, which were very plentiful amongſt the heath, deſtroyed many of the acorns, ſo that many of the holes were quite empty, and many had only one tree. Next winter many of the young ſhoots of the Oaks were cropped by the hares. They were to make good for three years before all the holes were full, which was a good deal of trouble and expence.

The growth of the plantation was very irregular; the Firs in ſome places ſpreading over the Oaks, and where they had been ſown the laſt time, to make up the deficiencies, not ſo high as the heath.

The young ſhoots of the Oaks were weak, being drawn, but very ſtraight, and when they got above the heath they were ſlender for ſome years. So that I think planting good young plants is better than ſowing acorns in ſuch ground.

The heath had no bad effect upon the ſown Firs, they grew faſt and ſtrong, and there were few of them deſtroyed by the mice; there were many to take away, and thoſe plants were much better than thoſe ſown in ſeed-beds according to the common method, and fit to plant in any ground; therefore if a plantation of them were intended and ſown alone, they would anſwer full as well as planting amongſt heath.

Where the ſeedling Oaks and Firs were ſown together, the Firs did not get the better of them for ſome years, but their ſide-branches at laſt ſpread ſo, that it became abſolutely neceſſary to take them away. The whole were accordingly taken away,

away, and replaced with Oaks of ſixteen inches high (two years old) from the ſeed-bed. They all throve very well, and a few years after the plantation was pretty equal, only the planted Oaks were ſtiffer than the ſown, and not ſo tall. No Firs ſhould be ſown nor planted with Oaks, let the ground be good or bad.

In the ſecond plantation, both Oaks and Firs did very well; but in ſix years the ſide-branches of the Firs over-topp'd the Oaks; and the ſeventh year there was a neceſſity of taking all the Firs away, which was done, and Oaks of three feet high, that had been removed from the ſeed-bed into the nurſery two years, planted in the room of the Firs.

They all grew very well, but the firſt-planted oaks were the fineſt trees ten years after, which is a good reaſon for making all plantations for timber of ſmall trees; for unleſs it be for pleaſure, where large trees are planted for ornamenting pleaſure

grounds, without any regard to timber, the ſmall-planted trees will in time make the fineſt woods, and in leſs time than thoſe that are planted large.

THE third plantation, planted with Oaks only, of three years old, eighteen inches high, and had never been removed from the ſeed-bed, grew extraordinaay well, and was the fineſt of all the three. There was no further trouble with it.

THE heath decays as the tree advances in height; and as they grow thick, the under-branches decay, and they have in general fine ſtraight ſtems.

THERE was on the ſame hill I planted on a plantation of Scotch Firs, which had been planted ſixty years. At the time the Firs were planted, ſuch high grounds were thought to be fit for no other kind of wood. They were fine trees and many of them were cut for uſe: the wood

was

was pretty good, but not come to its full growth. There was not one ſprig of heath on all the ground the Firs were planted on, and if it had been any other kind of wood but Firs, there would have been good feeding for cattle and ſheep, and good ſhelter.

ALTHOUGH, in all plantations where ſowing the ſeeds is recommended, I have given directions for ſowing all the kinds of Fir and Pine-ſeeds, yet the ſowing them on the place they are to remain in, on poor ground, is not the beſt method (unleſs amongſt corn or long heath) as they are ſo apt to be thrown out of the ground, eſpecially on poor land, where they grow very little the firſt year, and are very ſmall; and the ground being naturally very looſe, they are froze in winter below the roots, and many of them thrown out of the ground, and ſome of them are raiſed ſo as to ſtand like a ſpider, with a very ſmall part of their roots in the earth.

Those that ſtand ſo will grow, but their being raiſed ſo retards their growth much, and they look red and ſhoot little until their roots have got hold, which will not be for a year or two. A little ſoft moſs ſpread over the holes when they are ſown is of great uſe to prevent the froſt's penetrating the ground below the ſeedling's roots; but that is attended with ſome inconveniency, for it muſt be at leaſt an inch thick, or it will be of no ſervice; and then it encourages grubs and other vermin to lodge under it, and they very often deſtroy the young plants as they come out of the ground. The beſt method for all the Fir kinds is to ſow them and plant them from the ſeed-bed.

The compoſt for the ſeed-beds, and the method of ſowing and managing them, ſo as to make them fit for planting out the firſt year, will be fully explained under the article of ſowing all kinds of tree-ſeeds.

If there was any moſs ſpread over the holes and places where the Fir and Pine-ſeeds were ſown, it muſt not be removed when the ſupernumerary trees are taken up, unleſs the ſtem of the plant that is to ſtand be earthed up to the top; for it will be very tender by growing through the moſs, and would be in great danger of periſhing by the cold winds in ſpring. Earthing up the ſtem is more advantageous to the tree, and will greatly encourage its growth, but will be attended with a good deal of labour, as the ground ſhould be a foot level round the plant. If the moſs be left, the ſtem will harden as the moſs decays, and the plant will thrive very well.

The difference between planting and ſowing Firs is trifling, for both in rocky and poor land the holes and places are made the ſame for planting as ſowing; and it will take very near as much time to ſow a hole as to plant a ſingle tree into it; and the advantage is very great in favour

of planting, for the many reaſons before given.

A MAN may, with care, plant four hundred in a day, where the holes are made, and do them well. As they are planted, it would be of great ſervice to them to lay ſome long graſs, heath, or moſs round each; it will not be much trouble, as the parings which come off when the holes were made will be near at hand. It will keep out the drought in ſummer, and prevent the froſt from looſening the mould in winter; for although the froſt is not ſo detrimental to the planted tree as to the ſeedling plants, the tree will thrive much better when the mould is not ſo light about it.

FIRS and Pines are in general planted all the winter months, eſpecially the Scotch Fir, and very often with good ſucceſs; yet it is not the beſt method in poor ground, for the reaſons before given. Early in autumn is the beſt ſeaſon for planting them

in hard dry ground, provided the holes were made early and had ſome rain.

IT is the nature of the Fir to puſh roots immediately after they are planted, if the weather is free from froſt for ſome time. It will be a great advantage to trees of any kind to be well ſettled on dry grounds before winter, but there is none of them that get freſh roots but the Fir kinds. Firs may be planted to the end of April, but at that ſeaſon they ſhould not be long out of the ground.

WHERE there are large plantations of Scotch Firs that come to maturity, they bear ſeed in great plenty when about thirty years old. If there is any waſte ground joining the Fir wood that is covered with heath four or five inches long, if it was incloſed, and kept from cattle and ſheep, in a few years it would be very full of fine young plants, and will ſerve for a nurſery for ſeveral years, and ſtill there may be ſufficient trees left to grow into a wood.

When the trees are grown to eight and ten feet high, the young plants that ſpring yearly will not be fit for planting, as they will be drawn weak: and although ſome of them ſhould be ſtiff ſhort plants, they will be in danger of periſhing when taken out of ſuch cloſe places. So if there are many of theſe trees wanted, it will be the eaſieſt way of propagating them to take up yearly all the young trees that are fit, until there is a ſufficiency got; then they may be allowed to grow into a thick wood without any further care; and as they grow fit for uſe may be thinned as wanted.

There will be a great many to cut out, but there is no need of thinning them to any regularity or ſet diſtance, for the thicker they grow they make the finer wood. A great many will be over-topp'd and decay, but that is not minded in countries where thoſe woods all grow from ſelf-ſowing, and are the fineſt timber.

If the heath adjoining the Fir wood be long, when incloſed it will anſwer to make a wood, but will be of very little uſe as a nurſery, as the length of the heath will draw up the trees weak, and they will be void of branches on the ſides until they are grown above the heath, ſo will have long weak ſtems, and will not be fit to plant. They may be allowed to grow from the firſt coming up; they will grow very faſt, and ſoon be fit for uſe.

But ſuch grounds as produce long heath, may be better employed than with Fir-trees, as has been treated of in planting ground covered with long heath. I have heard of ſowing Fir-ſeeds broad-caſt amongſt heath, as corn, without any further trouble, and that it has ſucceeded very well.

This is ſomewhat ſimilar to what has been juſt now treated of, and I make no doubt the hint has been taken from that, or by ſeeing the ſeeds of trees come up in the

the grounds at a diſtance from the trees that bear ſeed.

But there is a great difference between ground around, and even at a diſtance from, ſeed-bearing trees being full of young plants, and ſowing in ground where there is no ſupply. Round a ſeed-bearing tree there will be plenty of young trees if cattle are kept off; and where there are vacancies it may be repleniſhed next year.

Whereas the ſeed that is ſown at random there muſt many periſh, and many more be deſtroyed by vermin; and as there is no ſupply, there may be many places empty; and as there is not the advantage of trees full of ſeed to make up the deficiencies, ſo there muſt be a want, if not made good by ſowing freſh ſeeds, which would be troubleſome and expenſive, as perhaps there would need repairs for years; ſo that the expences will be greater than following the directions given for ſowing Fir-ſeeds amongſt long heath, which is little trouble, and ſo eaſy that it may be performed by any labourer at a very ſmall expence.

A LITTLE quantity of ſeed will ſow a great deal of ground. One man will ſow and make the places for ſeveral hundreds in a day; and there is almoſt a certainty of ſucceſs: and what is more advantageous, if four or five good ſeeds are put into each place (as directed for ſowing Fir-ſeeds amongſt long heath) at three inches diſtance, there is a probability of having three or four good plants to ſpare in each hole for making more plantations.

WHAT has been ſaid of the ſucceſs of the incloſed waſte has been done frequently. There are many objections againſt ſowing the ſeeds at random. It were to be wiſhed that ſome public-ſpirited gentleman would try the experiment, not only with the Fir, but ſeveral other kinds of tree-ſeeds; it would be a great advantage if it anſwered.

THE preparation of tree-ſeeds is of great advantage, as it will in a great meaſure prevent their being deſtroyed by vermin, which

which is one principal objection for not ſowing all the poor land inſtead of planting; for ſown ſeeds grow much better than planted trees, eſpecially the larger ſorts.

The beſt ſeaſon for ſowing all kinds of Acorns, Beech-maſt, Cheſnuts, &c. would be the autumn, as ſoon as they are quite dry, were it not that they have to lay all winter in the ground before they vegetate; and the mice, who are very dextrous in finding them, will often deſtroy a great part of them; and frequently what they do not eat they will collect from different places into holes of their own making, leaving many places in the field without a ſeed, as I have often found to my great diſappointment.

To prevent as much as poſſible theſe inconveniencies, the prepared ſeeds, with equal ſucceſs, are ſown late in the ſpring, and are a very little time in the ground before they come up, and after they have begun

begun to vegetate, the mice are not ſo fond of them.

THERE is alſo another great misfortune that tree-ſeeds ſown in autumn are liable to, that is, if there ſhould come a few weeks of fine weather in the end of January or the beginning of February, it will cauſe the ſeeds to come up early, before the hard froſts are over, which is the deſtruction of many of the young plants, and ſometimes of the whole.

THIS does not, however, often happen, as there is ſeldom ſuch fine weather at that ſeaſon; but it is a misfortune ſeeds ſown in autumn are rather liable to, which the prepared ſeeds prevent, the danger being over before they are ſown.

THE ſmall birds are great enemies to all the tree-ſeeds that are ſmall, the Fir and Pine kinds in particular, and which bring up the ſeed with the firſt leaf; but as there are few of them on uncultivated heaths

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and commons, where there are no trees, they may eaſily be deſtroyed.

THE crows are the moſt miſchievous, and will deſtroy a large plantation in a ſhort time; for as ſoon as they find a field or common, ſown with tree-ſeeds, they will root with their bills, and ſcratch with their feet, until they get at the ſeed, although two inches deep in the ground, eſpecially Acorns and Beech-maſt, which they are very fond of.

THE beſt method I could ever find was to ſhoot ſome of them, pull off ſome of the feathers, ſcatter them about, open the crop, put ſome gunpowder on the inſide, and drop the carcaſes about the field: this will frighten them for ſome time, and as the prepared ſeeds are ſoon out of the ground, it will be a great means to ſave them from thoſe enemies, who are not ſo fond of them after ſprouting.

THE ſeeds of Acorns, Beech-maſt, and all

all kinds of nuts ſhould be kept in dry ſand all winter, in a place that is not damp, for the dampneſs would make them ſhoot too early in the ſpring for ſowing; nor in a place where there is any heat, for that would make them pine, but in a dry airy place. The Sycamore, rough-leafed Elm, and all the kinds of Firs and Pines, ſhould be kept dry without any ſand.

THE rough-leafed Elm is generally ſown as ſoon as dry after it is ripe, which frequently comes up the ſame ſeaſon, but ſometimes not till next ſpring, and then for the moſt part ſo early, that many of them are cut off by the froſt. If this often happens to them in warm nurſeries, they would ſtand a great chance of being all deſtroyed if ſown in fields or commons of poor land, as it is ſo late in the ſeaſon before the Elm-ſeed is ripe; for even thoſe that come up would be ſo ſmall and weak that they would be all thrown out of the ground, and thoſe that did not come up would periſh by wet and cold.

But if the ſeeds are thoroughly dried, and kept from damp, they would do very well to be prepared and ſown in ſpring, at the ſame time the other tree-ſeeds are, which is of great uſe, for they are very fit for many places on poor land, grow much better from the ſeed than when planted, and is a profitable good wood.

The preparation of tree-ſeeds, ſo as to have them vegetate before they are ſown, is what has never been practiſed nor known, and is of the greateſt uſe to ſave the ſeeds from vermin and froſt in ſpring, and from being injured by the froſts in the winter following.

As to the ſowing ſeeds in ſpring, that has already been ſhewn, and as they have all the advantages of thoſe ſown in autumn, and liable to none of their diſaſters, it is a great improvement; for as the ſevere froſts in ſpring are over before they are ſown, and they, by being prepared, are near as forward as if they had been ſown

in autumn, they have time to grow to a good ſize, and to have their roots well fixed in the ground, and are not liable to be thrown out of the ground by froſt the next winter.

THE preparing and vegetating tree-ſeeds before they are ſown is only following nature; for the ſeeds that are blown by the wind from the trees into different places, thoſe that grow are laid up by chance in ſecurity, and vegetate by the warmth and moiſture of the places they lay in ſooner than any that are ſown in the common way in the ſpring, although ſown as early as the weather will allow; and it is only doing what is every year practiſed, although it has never been thought of.

HAWTHORN and Holly-berries are buried in autumn as ſoon as they are pulled, and lay a year, and then are fit to be ſown. The pulp of thoſe berries is hard and dry, and takes a long time to rot, and until

that is quite rotten there can be no vegetation; and if no art is uſed they take a year; but as ſoon as they are pulled, if they were mixed with freſh grains, and turned over every three or four days for one month, and then lay all winter covered, ſo that no froſt can come at them, and turned over ſometimes to prevent mouldineſs, which would deſtroy them, they may then be ſown in the ſpring with the ſame ſucceſs as if they had been buried a whole year.

THE only danger in having tree-ſeeds ſprouted before they are ſown, is having their ſprouts rubbed off in ſowing; but of this, unleſs the perſons employed are extraordinarily heedleſs, there is no danger.

THE proper time for ſowing Hawthorn and Holly-berries, that have been buried a year, is the beginning of March; but by the hurry of other ſpring buſineſs, it may be ſometimes the middle of April before they can be ſown; by that time they

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are ſprouted a good length. I never found it any detriment to their growing, for it has happened to me ſeveral times.

I MENTION the Hawthorn, as every one is acquainted with the nature of its management, and knows it will grow very well when ſprouted before ſown. If the tree-ſeeds are managed as directed, they will not be ſo much ſprouted as the Hawthorns, and ſo will not be in any danger, but will anſwer every thing that has been ſaid of them, for there is nothing advanced but what I have practiſed often with good ſucceſs.

THIS method prevents many of the miſchances that ſowing tree-ſeeds are liable to; for as ſeeds ſown on hills, commons, and fields, ought to be done with great care, ſo it would be very troubleſome to have the whole to go over for a year or two to make up deficiencies; beſides the irregularity in their growth.

THE compoſition for preparing the ſeeds to vegetate is ſoft pit ſand (ſharp ſand will not anſwer) and freſh grains from the brew-houſe; the ſand ſhould be got in ſummer, and made very dry, and laid by until wanted; the grains muſt be freſh from the brewhouſe, but muſt be ſpread, turned, and dried until they are juſt of a clammy moiſture; then they ſhould be mixed with dry ſand in equal parts, until there is a ſufficiency for the quantity of ſeed to be prepared.

AFTER the ſand and grains are mixed, they muſt be rubbed between the hands, and laid in a heap for four days, then turned over every day for a week, then let them lay four days in the heap; and if then there is no mouldineſs, but a fine clammy moiſture, it is fit for uſe; but if there is the leaſt appearance of mould, it muſt be turned twice a day for three days, and then lay four days more; and if then there is no mould it may be uſed without danger, for here is nothing

that

that can be of the leaſt hurt but the mouldineſs.

When the compoſition is ready, have ſome boxes of different ſizes, according to the quantity of ſeeds; if the quantities are ſmall, garden-pots will do as well.

For the large ſeeds, ſuch as Acorns, Beech-maſt, &c. lay an inch of the compoſition at the bottom of the box or pot, then a layer of ſeeds; fill up all the vacancies quite level, then a layer of ſeeds; and ſo on till the whole be finiſhed. The Fir-ſeeds may be mixed with the hand and laid in the box, firſt laying half an inch of the compoſition in all the boxes or pots you lay ſeeds in.

The Elm-ſeed, Sycamore, or any other ſmall ſoft ſeeds, ſhould be rubbed between the hands with the compoſition, and ſo laid into the box, laying half an inch of the ſame ſtuff over all the tops of the pots or boxes, and place them in a dry place,

where no wet can come at them, and if it were where they could have the benefit of the ſun it would be better, but if that cannot be conveniently done, they will do very well without: if they have the ſun, the boxes or pots ſhould be turned every week, that each ſide may have the ſame advantage.

The large ſeeds, ſuch as Cheſnuts, Acorns, &c. ſhould be put into the compoſition the middle of February; the Fir and Pine-ſeeds, the beginning of March; and the Elm and ſuch other ſoft ſeeds, the middle of March: they will all be ready for ſowing the middle of April. Great care muſt be taken to keep them from wet and mice; the wet would cauſe them to mould and entirely ſpoil them, and if mice were to get into the boxes they would deſtroy the ſeeds in a ſhort time.

If the holes were made before winter, as has been directed, they will be in fine order for ſowing the middle of April; and

as

as at that ſeaſon the ſun has great force, and the holes being moiſt and mellow, the ſeeds will be above ground in a little time.

WHEN the ſeeds are to be taken from the pots and boxes, great care muſt be taken not to rub off the ſprouts. The beſt way to carry them into the field for ſowing is in little boxes with a handle; and as a ſmall quantity will ſow a great deal of ground, there ſhould not be too many taken out at a time; and it will be neceſſary to take ſome of the compoſition in the box with the ſeeds, to prevent the young ſhoots being hurt by the ſun and air, which would greatly damage them.

THIS work ſhould never be done when the wind is high, nor when the air is froſty; a calm dull day is the beſt; but if the ſun ſhines, if not froſty, it will do very well.

IF the heath, fields, or commons are planted

planted or ſown alternately, the planting being before finiſhed, there is only the holes left to be ſown, which ſhould be the ſame ſort as the trees planted; for I would adviſe by all means to keep the trees in ſeparate clumps.

THE Cheſnuts and all the other large ſeeds may be planted with a ſetting-ſtick, which ſhould be a little thicker than the ſeeds to be planted, that there may be ſome looſe mould lay round the ſeed; and it ſhould not be ſmall at the point, as that would cauſe a vacancy between the ſeed and the bottom of the hole. The holes ſhould be made two inches deep, and the ſeed dropped into them: there ſhould be four ſeeds planted in every place, at three inches diſtance from each other. All the holes, after the ſeeds are dropped in, ſhould be filled with looſe mould.

FOR the ſmaller ſeeds, ſuch as the Pines, Firs, Elms, and other ſmall ſoft ſeeds, there ſhould be four places made with the hand,

hand, half an inch deep, a ſeed dropped into each, and covered level with looſe mould. A man may perform a great deal of this work in a day, and there is not the leaſt doubt of ſucceſs.

THE propagation of trees to plant in poor ground has never been made a different article from raiſing trees in general; but it is very different, and very eaſy. In raiſing trees, they are moved from the ſeed-bed, the roots dreſſed, and planted in the nurſery, that the tap-root may be deſtroyed and made fit for moving, that the roots may ſpread horizontally, and not go too deep into the ground; but in poor land they are to be planted from the ſeed-bed, and the tap-root is to be preſerved, (which ſeems a contradiction) for it is on its length and ſtrength that the chief part depends; for without it there will be little hope of ſucceſs in planting on poor gravel, in heaths, commons, and rocky places, where there is little earth.

PREPARE

PREPARE ſome beds of good earth, and add to them a large quantity of ſand; let them be well worked over three or four times, ſo that the mould and ſand be well mixed a foot deep at leaſt. It would be beſt to do this in the beginning of winter; and let them lay all the winter in ſmall ridges, that the froſt may mellow them, and that the ſand and the mould may be well incorporated. Early in the ſpring dig them over and lay them flat; then, juſt before you intend to ſow them, dig them over again. This ſeems a great deal of labour, but the ſucceſs of the plantations, planted from trees here raiſed, will make it all well beſtowed.

AT the ſame time there ſhould be a good heap of the ſame ſort of mould and ſand that the beds are made of, as near as can be to them; and, if it can be had, a third part of black mould, from old woods, where ſticks and leaves have rotted for ſome time, which ſhould be all well mixed, and turned over ſeveral times to mellow.

THIS is to cover the ſeed-beds after they are ſown; for taking the mould out of the alleys to cover the beds (as is the common method) is not right; for it is ſo trod in ſowing the ſeeds, that it is difficult to break it to cover the ſeed; beſides it makes the alleys ſo deep that the ſides of the beds moulder down, and many of the trees are loſt, at leaſt they ſtand ſo dry that they make no progreſs.

THE beds being ready, they ſhould be ſown with the prepared ſeeds the middle of April, as they are the propereſt, being forwarded in their growth by being vegetated before they are ſown, ſo will be fine plants in autumn, when they are to be planted in the fields where they are to remain.

THE ſeeds may be brought in the boxes or pots they were laid in. The ſmall ſeeds may be ſown all over the beds, compoſition and ſeeds together, but not too thick, and covered half an inch with the mould

mould that was thrown in a heap for that purpoſe.

THE large ſeeds, ſuch as Acorns, Cheſnuts, &c. may be taken out of the boxes, and placed on the bed with the hand, at three inches diſtance, and covered with the ſame mould as the others, two inches thick: they will require no further trouble, but to keep them clear of weeds until they are taken up for planting. As the ſeeds were prepared, there ſhould none be ſown but what have ſprouted, that there may be no vacancies in the beds, if the mice can be kept away.

As ſoon as the ſmall-ſeeded plants are come into the third leaf, they muſt not be ſuffered to ſtand nearer to one another than three inches, that they may grow ſtrong and ſtiff, and have a free air in the ſeed-bed, which is of great utility to them when they change their quarters to a poor cold heath or common.

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THE reaſon of their growing to the third leaf before they are thinned, is that they may be of uſe, and by ſtanding a year in the beds they are planted in, will be as fit for planting in poor land as thoſe in the ſeed-beds. It may be imagined that at that age they will be too ſmall and tender, and will not bear tranſplanting; but they will, and grow very well, if carefully planted.

IF there is occaſion for more trees than can ſtand in the ſeed-beds, they ſhould be planted; and there is this advantage, that as they muſt ſtand another year in the beds they are planted in, before they will be fit to remove into the commons where they are to remain for good, ſo that there will be a proviſion of trees for two years, equally good, from the ſame ſowing; but if they are not planted, they muſt be pulled out of the ſeed-bed, for there they muſt not ſtand cloſer than three inches.

IF the young plants, thinned from amongſt

amongſt thoſe ſown, are intended to be ſaved, there muſt be ſome ſpare beds, the ſame as the ſeeds were ſown in; and the evening before the ſeed-beds are to be thinned, they ſhould be well watered, to make thoſe that are to be drawn come up eaſy. There will be ſome that will break in drawing, but that muſt not be regarded; for it would be quite wrong to looſen them, as it would damage the plants that ſtand in the bed more than the value of thoſe that will be broke.

DRAW only a few at a time, make a hole with a ſetting-ſtick, and let them down the whole length of their ſingle ſtraight root (for at that age they have no fibres) and cloſe the earth gently to them, for their ſtems are very tender.

GREAT care muſt be taken to let down their root ſtraight its full length, or they will not be fit for planting on poor land; but will anſwer very well for plantations on tolerable good land.

AFTER

AFTER they are planted they ſhould have a little water every other day for eight or ten days, but they muſt have very little at firſt; for as their ſtems are tender much water would rot them. If the weather is clear, they ſhould be ſhaded for three or four days, and then they require no further trouble. I have had very good ſucceſs ſeveral years in this very way, and never allowed ſeedlings to grow too thick in the ſeed-bed, which is frequently practiſed: the bad conſequence attending ſuch management is too obvious to want any explanation.

THERE is one thing I cannot omit taking notice of. It is the general opinion that all trees ſhould be raiſed on a ground ſimilar to that they are intended to be planted in; this is certainly wrong; and I dare ſay that moſt, if not all, the nurſery-men in England will join in the ſame opinion.

THE whole of what has been treated of

is planting on poor land, on which it is very certain a wood may be raiſed both by planting and ſowing; but it would be an odd attempt to make a nurſery to tranſplant from on ſuch ground. The ſeeds, when ſown in ſuch places, find nouriſhment for their ſmall roots to ſupply their little heads, whoſe progreſs is ſlow until they gather ſtrength, and when they get to three and four feet high, their own warmneſs makes them grow faſter than could be expected; and in the holes that are ſown, the plants that are to ſpare in them are not fit for planting in ſuch ground; they have little heads and ſmall fibrous tufty roots, and would be all thrown out of the ground in winter, at leaſt ſo looſened as never to make a tree.

If an animal was to be only half fed, from its firſt having life, for one year, I believe that ſuch an animal would never grow to be of a large ſize of its kind, if afterwards it was put into better keeping; but ſuppoſe it was put to harder fare; I believe

believe it would make a poor figure. If this ſame animal had been moderately fed for one year, and then put it into worſe feeding, it would have been a better beaſt.

THUS it is with trees; if they are ſown in ſuch poor hard dry land, they are hide-bound from the beginning, and it would be ſome years before they would recover, were they tranſplanted into good ground. What then muſt be their caſe when tranſplanted into the ſame ſort of ground, perhaps into a colder ſituation?

I HAVE been longer on this point than I intended, becauſe it is often recommended that the nurſery be as near as poſſible to the ground the trees are to be planted in.

ALL public nurſeries in the kingdom, that are of fame, are on fine light good land; and many years experience ſhews that all kinds of trees and plants bought from them thrive very well, although for

the moſt part planted in much worſe ground than where they were raiſed.

It would not be right to raiſe trees for planting in poor land on ground made very rich with dung; but it would be much worſe to pretend to raiſe them on a very poor ſoil. If the beds for ſowing the ſeeds are made as here directed, they will produce fine plants for the purpoſe, and there will be no doubt of their ſucceſs when planted in the very worſt ground.

The management and ſowing the ſeeds, as alſo the raiſing of the trees, for planting poor land, are all fully explained.

We now proceed to the planting, which may be either alternate, or wholly detached. I would recommend alternate planting and ſowing, unleſs where it is otherwiſe directed; that is, all the Fir and Pine kinds ſhould be *all* ſown or *all* planted; but planting them is much the beſt, as it is almoſt impoſſible to ſave the young

ſeedling

ſeedling plants from being hove out of the ground on poor land in winter; ſo it would be better to let the Firs, Pines, and Larches be two years old before they are planted, but they muſt not be moved from the ſeed-bed, but thinned as before directed.

THEIR roots are ſmall and tufty, and eaſily managed, and may be ſpread about when planted without cutting any of them, which will cauſe them to get good hold of the ground, and be in no danger of being thrown out of the ground by froſt.

ALL the deciduous trees, but the Oak and Larch (which are much better to plant in ſpring) may be planted from the decay of the leaf, in any of the winter months when the weather is mild, to the latter end of February, after which it will not be proper to plant in poor land and in hard dry ground; for if the ſpring ſhould prove dry, which it often does, thoſe

planted later would be in great danger of being loſt.

ALL the trees muſt be planted from the ſeed-bed of the ſame year's growth; but thoſe that were thinned from the ſeed-beds and planted out, will be ſo much retarded by being moved, that they will not be fit for planting till the ſucceeding winter. Thoſe that were ſown in the ſeed-bed, and not planted out the firſt winter, their tap-roots will become ſo ſtrong and ſtubborn, that they will be difficult to manage in planting; and on the tap-roots being properly diſpoſed depends the ſucceſs of planting in poor land.

IF there are any left that may not have been wanted, or that there is not time to plant, they muſt not be left for another year, but muſt be taken up, have their roots dreſſed, and planted in the nurſery in the common method, to make other plantations in good land; for there ſhould none be planted in poor ground, but from the ſeed-bed of that year's ſowing.

THE planting in poor land is quite different from planting where there is plenty, or even a moderate quantity, of ſoil; for where there is ſo little as two or three inches, if the roots are planted lower than that, there is nothing for them to ſtrike into but gravel or rock, where it is impoſſible for them to thrive.

THE holes being made as before directed, make them flat at top, and if they are two or three inches higher than the ground, ſo much the better; for they will ſink down level with the other ground in a little time, as their being higher is only from the earth's being ſtirred.

TAKE up the trees from the ſeed-bed carefully, taking great care to break none of their roots, and take no more up than can be planted in a day; lay them in a flat baſket with ſome moſs over their roots, and carry them into the field or common where they are to be planted.

OPEN the hole five or ſix inches length-ways, which may be done by only ſtriking the ſpade into the middle of the hole after it is flattened at top, which will be the length of the tap-roots if they have throve well. Lay in the root two or three inches deep, as the ground will permit, at its whole length, horizontally, and then raiſe up the plant at the neck, in the ſame manner as in the planting of trees; faſten the earth to the plant, keeping its top upright; after the plant is faſtened, looſen the top of the ground with the ſpade, this prevents it from cracking, and is of great ſervice; for if the top of the ground be left hard, two or three dry days make it open as deep as the roots, and dries them, and ſo ruins the whole plantation.

IN light ground, where trees are raiſed, they will have but very few roots but the tap-root, and that is the reaſon that it is made ſo light to prevent ſhort tufty roots: they will be full of ſmall fibres, none of which

which ſhould be cut off, and particular care ſhould be taken to keep them from ſun and wind, which would ſoon dry them, to the great detriment of the plant, for it is from them the tree begins to ſtrike roots: as they are very ſmall, they are very ſoon dried by either ſun or wind. If it ſhould happen by any accident they are, cut them off one inch diſtant from the tap-root; but it will be more beneficial to the tree if there is no occaſion for any of theſe amputations.

THE laying the roots at their whole length horizontally prevents the roots from ever attempting to run down into the gravel, which they would, if planted in any other method, and this is the reaſon that plantations on gravelly and rocky grounds have hitherto made ſo little progreſs.

THIS method of planting on poor land is entirely new, and as it is ſo different from all kinds of planting hitherto practiſed,

tiſed, it may ſeem very wrong, as dreſſing and cutting the roots are the firſt things recommended by all that have given directions about planting. But let thoſe who have ſuch ground to plant, only follow the directions given with accuracy, and they will find them anſwer beyond their expectation.

THE laying the roots horizontally prevents the trees from being raiſed out of the ground by froſt; and as the roots will, by this method, run juſt below the ſurface, they will have all the advantages it is poſſible for them to have in ſuch ſhallow grounds; and this is the reaſon that trees raiſed on poor ſoil are not fit to plant again in the ſame ſort of ſoil, as their roots are ſhort, and ſeldom have a tap-root.

IT would be adviſeable to plant ſo that the bend at the neck of the tree be always againſt the ſun; for if the tap-root be very ſtrong, and there being no great depth of earth to make it faſt, it may throw the

top

top of the tree aſide; if it does (which ſeldom will happen if properly planted) the ſun will draw it ſtraight; but if the bend was to the ſun, and happen not to be upright, the tree would never be ſtraight. Were it not for that reaſon, it would be indifferent how the trees were placed.

THERE ſhould be two men employed in planting; one to open the ground, and the other to put in the tree, as it would be a great loſs of time to lay down the ſpade ſo often: they ſhould have a little box or baſket with a handle, into which they ſhould put a few trees at a time, with a little moſs over their roots; this will be very handy, as the man that plants muſt uſe both his hands in planting. This work ſhould never be performed when the wind is high, nor when the air is froſty.

THERE is another method of planting poor land that is either in ſhort graſs or ſhort heath, which is very expeditious, and

alſo

alſo very advantageous, for it effectually prevents the drought from penetrating in ſummer, and the froſt from hurting the roots in winter. Two men will plant five or ſix hundred in a day with eaſe. This ſort of planting ſhould be done in winter when the ground is full of wet; the beſt ſeaſon is after a deep ſnow is gone off with a ſudden thaw; and at that time little work can be done in any other grounds, as they will be too wet to plant in.

THE trees are to be raiſed and managed in the ſame manner in every reſpect as the other trees for planting on poor lands, with all the precautions concerning their roots. A man with a ſpade makes a nick a little longer than the root of the tree in the graſs or heath, two or three inches deep, as the ground will allow, laying in the roots at the whole length horizontally, preſſing the ground cloſe with the foot, and with the ſpade nicks the ground croſs and croſs all round the plant: this prevents the nick from opening, which, without

that

that precaution, it would be very apt to do in ſummer when the weather is very dry; it alſo prevents the wet from running off, which it does where there is a deſcent, and the graſs is not nicked.

If the ground is very ſhallow and not rocky, this is the beſt method of planting; but if the ground is very ſtony, it is not practicable, as the ſtones would render it very troubleſome to make the nicks, which interruption would often happen in the middle, ſo as to prevent the roots from being laid horizontally or ſtraight.

The trees for ſuch plantations, that have not their roots dreſſed, ſhould never be brought a great diſtance, for it will be impoſſible to prevent their ſmall fibrous roots from drying, if they are kept long out of the ground; but if we cannot avoid bringing them from ſome diſtance, they muſt be carefully taken up and packed in wet moſs: they will do very well for five or ſix days; but if they lie much longer, their

their ſmall roots will begin to mould, and muſt be cut off before they are planted, or their mouldineſs will deſtroy the large roots. If they come packed in moſs, they ſhould not be unpacked, but taken out as they are wanted, and planted as ſoon as poſſible.

It has been a common practice to ſend to the north for ſeedling-trees, where they are bought at a very cheap rate for planting out in poor land. In general the ſucceſs has been bad, and there are many good reaſons for its being ſo.

By chance there may be tolerably good ſucceſs, but it is a very bad practice; for theſe trees are ſown as thick as they can grow, ſo that they have no free air, and by their cloſeneſs and their own warmth they are drawn up weak, and their ſtems are very tender, like a plant that is earthed up to blanch. This is eaſily to be diſcovered by obſerving the lower part of the ſtem, which is of a languid green for want of air, and the

the top quite of another colour where the air had a free paſſage.

WHEN trees thus raiſed are taken from their cloſe warm ſituation, and expoſed ſingly to all weathers in poor cold ground, or in any ground, many of them will periſh, although ever ſo carefully planted; and as all their roots muſt be dreſſed (as they will be either mouldy or very dry) they have none of the advantages of thoſe ſeedlings raiſed according to the directions before given. Thoſe ſtems are ſtiff and ſtrong, for as they were not allowed to grow nearer than three or four inches in the ſeed-bed, the air paſſes freely amongſt them, and their ſtems are as hard as if they had been planted out three or four years, which is of great ſervice when they are planted in the fields.

IT is impoſſible that trees raiſed in the manner here directed can be ſold ſo cheap as thoſe that grow ſo thick as to be pulled up by handfuls from the ſeed-beds. But

it will be more to the purchaſer's advantage to give ten ſhillings a thouſand for trees thus raiſed, than to give one ſhilling for thoſe that are ſown and grow ſo thick; there is more than that difference to the nurſeryman, as twenty will grow in the thick ſeed-bed for one in thoſe that are properly managed.

THERE are many thouſands of Scotch Firs ſold in and near London, and many other places in the country, that are brought many miles, and are ſome months out of the ground; theſe are ſown in the ſeed-bed as thick as graſs. Beſides the other diſadvantages they have in common with other foreſt-trees, as Oak, Beech, &c. they are very ſubject to be rotted in their ſtem even to the ground; and although they appear green at top, and the ſmall roots they have are freſh, they decay and go off as ſoon as planted out and expoſed to the air.

IF any ſuch trees are purchaſed, the beſt

method to manage them would be to dreſs their roots, and plant them in the nurſery at ſix inches diſtance, and in a year or two thoſe that grow will be good plants; but as many of them will decay, it would be troubleſome and very expenſive to have them to go over for a year or two to make good the deficiencies, if they were at firſt planted in a large common.

THIS is mentioned by way of caution, as ſome gentlemen may think they have made a good purchaſe by getting ſo many thouſand trees for ſo ſmall a ſum, much leſs than the expence of raiſing them would be; but thoſe that make ſuch bargains will find to their great diſappointment they have paid very dear, and had better have got good plants, if they had paid a much greater price.

WHAT has been treated of is only for the raiſing of trees to plant out the firſt year, from the ſeed-bed, into poor barren ground, and is different from the manage-

ment of raiſing trees to be tranſplanted from the ſeed-bed into the nurſery, to be trained for ſome years to make plantations on different kinds of ground, where there is a ſufficient depth of earth to make holes.

SUCH trees need not be thinned to ſo great a diſtance in the ſeed-bed as thoſe for planting poor land, as they ſhould be taken from the ſeed-bed and have their roots dreſſed, and planted in rows at a ſmall diſtance, to ſtand a few years, and then to be removed again and dreſſed top and bottom, and planted at a greater diſtance, where they may remain until they are taken to plant in the fields to make plantations to grow for timber.

IT is a great advantage for all kinds of ſeedling-trees to be ſo thin in the ſeed-bed that the air may paſs freely amongſt them in the ſummer; they do not grow ſo tall, but there will be very few of them but will grow, and be much better when removed.

THERE are many gentlemen who are at the expence of trenching in all kinds of ground intended for planting. If it is a poor ſhallow ſoil it is wrong, becauſe the gravel muſt be thrown up or there can be no trench, and the little mould there is will be loſt, and nothing left for the trees to ſtrike roots in but gravel, mixed with a ſmall quantity of earth, ſo ſmall that it will not be viſible in a dry ſummer: they ſtand but a poor chance to grow. If the trees were planted according to the directions before given, without trenching, they would thrive much better than it is poſſible for them to do in the trenched gravel.

IF the ground be clay, and a ſmall quantity of earth at top, it is of very bad conſequence to trench; for to make even a very ſhallow trench there muſt be a good deal of clay thrown up. If the earth be mixed with the clay it will be loſt; if laid in the bottom, it is turned down lower than trees ſhould be planted in ſuch ground, or the trench muſt be ſo ſhallow as to be next to

no trench; therefore the trees in that caſe will be planted in clean clay, and will languiſh many years before they reach the good ground laid in the bottom in trenching, and often ſo as never to recover, which I have frequently ſeen. To plant in clay, where the ſoil is very ſhallow, the ſame method ſhould be followed as planting in poor gravel.

If the ground is good, trenching is attended with a great expence to no purpoſe; for if the trees are ſmall or large, if the holes are made ſix inches wider than the roots all round, for the young roots to ſtrike into, they will grow as well as if the whole had been trenched, as the trees growing on rocks where there is very little (and what there is very hard) fully demonſtrate; for the roots twiſt and twine round the ſtones, and penetrate the earth between them, which is extremely hard; as alſo by tree roots going down into hard clay, which fully ſhews there is no occaſion to trench for timber-trees.

BESIDES the trenching there is another expence ſaved. Good land, when trenched, plowed, or dug, grows full of ſtrong weeds, and muſt be kept clean, or they will greatly impoveriſh the ground; and this will require to be performed for ſome years.

I HAVE here deviated from what I purpoſed, but as I have ſeen plantations made at a great expence by trenching, in all the different kinds of ſoil here mentioned, I have planted on all the ſame ſorts of ſoils according to the directions here given, with better ſucceſs and at a ſmall expence.

CHAP. IV.

On thick Planting, and the Management of Woods that have been neglected.

THICK planting has been recommended and practiſed many years; but the method of dreſſing and thinning is very ſeldom properly performed. The prejudices againſt pruning are ſo great, that we frequently ſee thickets of ſmall drawn-up trees of immenſe height, without a poſſibility of ever having good boles.

FOR the advantage of thoſe gentlemen that have ſuch thickets within a poſſibility of recovery, that is, from ſix years old to twenty, the following directions will be of uſe for making fine trees of what, in a few years, would be paſt redemption.

IF a plantation has been planted five or ſix years, and planted at three, four, five,

or

or ſix feet diſtance (for the diſtance ſhould be according to the goodneſs of the ground) and this neglected ever ſince planting, we ſhall find, if the trees have throve any thing like, they will all be mere thickets.

It will not be proper to remove any trees to plant in another place from ſuch a thicket directly, for as they have been long ſo very cloſe, and have had no free air, they will be very unfit to remove, becauſe their ſtems will be very tender.

First, let all the large branches be cut off cloſe to the bole, and all the other parts of the tree be dreſſed according to the directions for pruning: let this be done for two years, and then every other tree may be removed with ſafety, and planted again. The pruning of the trees left in the old plantation muſt be continued until the trees have got ſufficient length of bole.

The trees that were removed, if they

were carried without earth, will want little this year; but if they had balls there will be little difference, and they muſt be treated accordingly, and they will ſtill make fine trees.

If the plantation has been planted ten or twelve years, and has had no care taken of it all that time, if the ground be good they will be very tall and ſmall, and never will be fit for planting, for they would be ſo tall and ſlender, that they would never be able to ſtand the wind, nor ſupport their own heads.

Weak trees taken from cloſe thickets ſeldom make good trees; for beſides their being tall, they have few ſide-branches, and ſhoot (if they grow) ſo faſt at top as to be moſtly crooked.

If under-wood is of value, ſuch thickets are very fit to make a good wood of that kind, but it muſt be done with caution; for as the trees are tall and ſmall, and few

ſide-

ſide-branches but juſt at the top, they would be very liable to be much toſſed and hurt by the wind if thinned too much at firſt; beſides, if they are expoſed to the free air all at once, many of them will be in danger of periſhing, for they are very tender by being ſo many years without a free air paſſing amongſt them.

If ſuch thickets are deſigned for timber-trees only, and were planted at three feet diſtance at firſt, let all the large branches of the trees be cut off the firſt year, and none the next year.

Stub up every other tree, and mark the trees that are to ſtand, and let them be pruned and dreſſed according to the directions for pruning. The other trees that are to be taken up, ſhould have the long branches cut off and ſtand till next winter, and then ſtubbed: by this method the trees will have the free air admitted amongſt them gradually; and if they are afterwards

pruned

pruned regularly, in a few years they will thrive and be fine trees.

If under-wood and timber is deſigned, and that the under-wood is to remain, the timber-trees ſhould be marked, and all the trees round them have all their ſide-branches ſnagged off a foot long, ſo as to give air and harden the tree that is to ſtand, which ſhould have all the ſtrong branches cut off cloſe to the ſtem.

Next winter all the trees round the timber-tree ſhould be ſtubbed, and it ſhould be dreſſed according to the directions for pruning. The winter following all the trees that are deſigned for under-wood ſhould be cut clean cloſe by the ground; they will ſhoot very faſt and grow very thick. The timber-trees ſhould not be left nearer than fifty feet to each other, for it is impoſſible to have good under-wood if they are nearer.

If the under-wood is only designed to remain for a term of years, that is, until the trees grow up, the timber-trees may be left at ten feet, if the ground is very good; but if it is only middling land, eight will be sufficient.

A PLANTATION converted into timber-trees and under-wood that is to remain on good land, will be of more value than any other way it can be employed; for in countries where firing is scarce it will every fourteen years yield a great profit to the proprietor, much more than good corn crops, if their whole value was calculated to the greatest nicety. And as the timber-trees are still growing, and will have very tall boles if they were managed as directed, they will be of very little detriment to the under-wood, and when they are of age to cut will be of great value.

If the plantation be seventeen or eighteen years old, never pruned nor dressed, and planted at three or four feet distance, there

there muſt be great caution uſed to bring it into order.

THE trees will be very tall and ſlender, and have very few ſide-branches, and thoſe that are will be moſtly at the top and very long; their roots will be all intermixed, ſo that there will be no poſſibility of even ſtubbing any of them without hurting the roots of thoſe that are to remain.

THE only method that can be taken with trees that are thus tall and ſlender, is to cut out every other tree cloſe to the ground, and the long ſide-branches, ſome of which will be very thick, ſhould be cut off at a foot from the bole of the tree, that there may no blemiſhes be made in the bole.

THE heads of the trees ſhould alſo be thinned and lightened, for they will be all top-heavy, and be much hurt by the wind, which will have great power on them.

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As they have had only every other tree cut off, if they were three feet diſtance at firſt planting, they will now be only ſix feet diſtance, which is too little if the land is very good; but it will be beſt to let them remain ſo for two or three years, and by that time the trees that are to ſtand for timber will be hardened a little, and have got ſome little ſtrength.

Before there are any trees cut, the beſt that are to ſtand ſhould be marked, and thoſe that are to be taken away may have their ſide-branches cut off at random; but thoſe that are to remain for timber ſhould be dreſſed according to the directions for pruning. When thoſe that are to ſtand have got ſome ſtrength, the other trees ſhould be cut off cloſe to the ground.

It will be many years before ſuch trees recover, and never will make ſuch good trees as if they had been dreſſed ſooner; and this is all that can be done for plantations that have been ſo long neglected.

The

THE trees that were cut off will ſhoot ſtrong, and make good under-wood for ſome years; that is, till the trees get ſome ſide-branches, and grow to a ſize to ſmother it. But in ſuch thickets, as the trees are ſo tall, it would be very improper to thin them to ſuch a diſtance as to make a laſting crop of under-wood and timber-trees; for as they are very tall, and not ſtrong in proportion to their height, the wind would ſhake them ſo much, if it did not break them, that they would be in great danger of being, what is termed by the wood-workers, *ſhaken*, which greatly leſſens the value of the tree.

THE under-wood will ſhoot very faſt, five or ſix feet the firſt year, and will be of great ſervice to the ſtanding timber-trees; in three years time it will be as high as the boles of the trees; but as their heads will always be above, it will not draw them, and they will grow very ſtrong.

BEFORE

BEFORE the under-wood is fit to cut, the timber-trees will be a good deal proportioned in their bodies to their height, and the winds will not hurt them when the under-wood is cut.

As the under-wood will be very thick, it will prevent any ſide-ſhoots growing on the bole of the timber-trees, ſo that after the third year there will be no occaſion to prune them, nor in ſummer to pull off any of the ſide-branches; for if there ſhould any ſide-branches ſprout on the bole after that time, the thickneſs of the bruſh-wood, which will be very cloſe, will ſmother them, ſo that they will decay next year. There will then be no further trouble.

ALL trees that have been neglected, and have great ſide-branches, although they grow in avenues or ſingle trees, may be brought into order, ſo as to increaſe the ſize of their boles, but they will not be very ſightly, as all the large arms ſhould

be cut off a foot from the body of the tree; and it will be abſolutely neceſſary to pull off the young ſhoots in ſummer, that ſhoot from the places where the large branches were cut off; for as they ſtand ſo open, they will puſh many ſtrong ſhoots, which will be more detrimental to the tree, if not pulled off, than if it had never been cut; for there are often to be ſeen trees that have had large branches cut off, and then neglected for four or five years, and then cut again, with their whole bodies one continued blemiſh.

This is the error that the workers, in wood ſo juſtly complain of, and it is in general imputed to the pruning of timber-trees; but it is not regular pruning, but the neglect of performing it properly that is the occaſion of this diſaſter.

It ſhould be obſerved, that none of the directions here given will anſwer with any of the turpentine kinds, as they never ſhoot after cutting; ſo if there are any thickets

thickets of them, the beſt way is to thin them gradually at two or three different times, and leave them as regular as poſſible.

ALL the pine kinds will thrive and grow to fine timber at eight feet diſtance on the beſt of ground; and all the ſorts of firs at ten feet diſtance. The only way to have fine trees of thoſe kinds is to keep them thick, for they extend their ſide-branches to a great length when they have room to ſpread, and do not grow ſo tall and ſtraight in their boles as when they are confined.

PLANTATIONS of eighteen or twenty years old, that have been neglected and are very thick, may be brought to order by following the directions for that purpoſe, which will preſerve many good trees; but if it is in a country where firing is ſcarce, and of conſequence under-wood of great value, they would turn to more profit to cut them all down an inch below ground,

for they will grow very fast and very thick.

In the beginning of July, some stools that have fine shoots may be marked at forty or fifty feet distance, of the kind the most proper for the soil, or what the proprietor likes best (if there are different kinds of trees in the plantation) and all the shoots but one pulled off by the hand; they will come off very easily at that season, as the wood will be very thick.

In the winter, stub a root or two the neareſt to those that are to stand for timber, that they may have free air: they will make finer trees than if they had been treated in any other manner.

It will be necessary to examine their bottoms next summer, and pull off the shoots, if any more have grown: they must be pruned and dressed as other trees; and as they have free air and warmth they will grow amazingly, and in ten years time

time be much finer trees than they would have been at the age if they had not been cut down.

PLANTATIONS that have been planted on tolerable or even very good land with trees from the nurſery, of five or ſix feet high, and do not ſeem to thrive, whoſe bark looks reddiſh, and puſh many ſmall ſide-ſhoots, and whoſe leading ſhoot often decays, after they have been planted three or four years, if they do not take to growing, cut them off an inch below the ground in any of the winter months.

THEY will puſh many ſhoots next ſummer; in the beginning of July pull them all off but one of the ſtrongeſt; faſten the earth about the ſhoot to prevent the wind breaking it, which is the only danger it is liable to; they will then grow very freely, and ſoon be fine trees.

THIS method will anſwer very well for all kinds of deciduous trees, the oak in

particular: they will ſhoot a yard the firſt year, and be handſome ſtraight trees; whereas before they did not ſhoot two inches, and even that killed in winter, becauſe it never came to maturity.

This muſt never be attempted on trees that are planted on poor land, becauſe all trees on poor ground are ſeemingly hide-bound for ſome years after they are planted, and never make any progreſs until they have been ſome time at a ſtand; if they were to be cut down they would make ſhoots, but they would be very weak; the wood would not be ripened, as it would be long before they ſhoot in the ſpring, and they would be in danger of being killed in winter.

The bottoms of all trees that are cut down muſt be carefully kept clean of all ſhoots; they muſt be pulled off by the hand; this muſt not be neglected for two or three years, for if the young ſhoot that is encouraged grows well, which there is no-

no doubt but it will, there will ſhoots come from the bottom for ſome time: theſe muſt be pruned and dreſſed according to the general rules for pruning and dreſſing foreſt-trees.

THERE are many kinds of wood very beneficial to be raiſed where public works are carried on at or near the place, which occaſions a great demand for wood.

WHERE there are coal-pits whoſe roofs are bad, and require a great deal of wood for ſupports, it would be of great advantage in ſuch places to allot twenty acres of good land to be ſown with aſh-ſeeds, which grow very faſt.

AFTER they are come to a proper ſize, if the ground was quite cleared as they were wanted, there would be an immenſe quantity of wood. They would be fit for ſuch uſes in about twenty years after ſowing; and if the field was begun at one end and cut regularly, before they were all

gone over, that which was firſt cut would be fit for uſe, if the demand was not very great.

THE ſowing of aſh-ſeeds will be of great profit in ſuch places where much wood is wanted. The beſt method to have it come to maturity ſoon, is to ſow it in a field that has been corn a few years, the ſoil rich, and in good condition. Give it a winter fallow, and as ſoon as it is dry in ſpring plow it again, and let it lie until the beginning of April. The ſeeds being prepared, ſow them broad-caſt all over the field, and then a thin crop of oats; harrow the whole.

THE corn muſt be cut high, and all the precautions that were given in the directions for ſowing amongſt corn obſerved. In the winter they ſhould be thinned where too thick, and in the ſummer, for a year or two, have the large weeds pulled from amongſt them, and they will require no more trouble.

As

As they grow thick there will be no occaſion for pruning or dreſſing; only when any part of the field is cut in the winter, the next ſummer all the ſhoots, but two or three of the beſt, ſhould be pulled off from the ſtools, and thoſe left ſhould be at as equal diſtances as poſſible. There will be no occaſion to pull them any more, as the thickneſs of the wood will ſmother what ſprings after the firſt ſummer. This ſhould be done every cutting.

THERE ſhould never be any trees weeded out, for that, in a few years, would ſpoil the whole field; for as the wood will be very cloſe, the young ſhoots that ſprouted from the tree which was cut would want free air, be drawn up weak, and grow crooked.

UNDER-WOODS of Beech and Hornbeam will be very profitable where much charcoal is wanted; for if they are cut clean they will grow very faſt from the ſtools,

and be of a good size. Although they be very thick, there is no occasion for doing any thing to them after they are cut; only clear the ground of all rubbish, and let them grow as nature directs, and they answer very well.

THERE are many compositions recommended (and all of them would be a great expence if used for a large plantation) as fit to cover the places where large branches have been cut off; and that by applying any of them, they will prevent any blemish in the tree, although the bough cut off be very large and cut close.

THIS I cannot agree to, as I have seen it often tried, and never found it answer. If any of them are laid on too hot it burns the bark all round the amputation, and makes the wound larger, and the bark rises so that it is long before it begins to cover. If it be laid on too cold it never joins well, but cracks and falls off. If they

they are laid on juſt of a right warmth, they will ſtick until the bark grows over the wound, but there will be a dead place in the body of the tree, although the bark in time will cover the wound.

THERE can no large branch be cut cloſe to the bole without making a blemiſh. When the bark on the bole of any tree is bruiſed, or rubbed againſt by carts or any other accident, if the looſe bark is pared off immediately, and a compoſition of equal quantities of clay and cow-dung be mixed ſo thin as to be laid on with a bruſh, as paint, all over the wounded place, and as ſoon as it is a little dry lay a plaiſter of the ſame compoſition, made pretty ſtiff, about half an inch thick all over, and daſh it with a little dry mould to prevent its cracking, there will be no blemiſh.

BUT if the application is not made before the wound dries, where the tree was hurt there will be a blemiſh, but the bark will

will grow over better and ſooner with this than any of thoſe compoſitions that are ſo highly recommended, and at no expence.

THE laying the firſt on ſo thin and with a bruſh is, that there may no part be miſſed, for it penetrates into all the ſides of the tree, cloſe to the ſides of the ſound bark, and it alſo prevents the ſtiff plaiſter from dropping off by the heat of the ſun, which it would do if a thick plaiſter was laid firſt on the wounded place.

IF any favourite detached tree ſhould have the misfortune to have a large arm or branch ſplit, ſo as to hang almoſt by the bark of one ſide, let all the fractured places be bruſhed over with the thin ſtuff, and then half an inch thick of the ſame be laid all over.

RAISE the branch to its proper poſition, ſo that the bark fits all round, and then ſecured with props, ſo as to prevent the wind ſhaking it; then apply a plaiſter of the

the ſame, pretty ſtiff, all round the branch ſix inches above and below the ſplinter, which ſhould have a coarſe cloth lapped all round to prevent its cracking, and faſtened with a ſmall rope wrapped quite cloſe. It will unite and grow, and in a few years be as ſound as ever.

The compoſition of cow-dung and clay is better for all wounded places in trees than any of the grafting waxes uſed for that purpoſe. Although this has no connection with planting, it is often of great ſervice to trees that meet with accidents.

If a branch is broken by the wind, and ſlips off a good deal of the bark, lay on the thin ſtuff with the bruſh firſt, and then a plaiſter of the ſame made a little ſtiffer, taking care to let it be an inch wider than the wound, and be quite thin at the ſides to prevent its coming off by the heat of the ſun, and it will anſwer beyond expectation. There is no danger in laying it on, and, if it is well faſtened to the tree, it will

will ſtick until the wound is covered with new bark. After the plaiſter is laid on, and a little dried, if it was bruſhed all over with ſome of the thin that was firſt laid on, it would prevent its cracking and fill up all the cavities, ſo that no air could get between the plaiſter and the tree; which if it does, the whole falls off, and will be of no ſervice.

THE dung and clay ſhould be mixed ſome time before it is uſed, and worked ſeveral times, that it may be well united; if it was for three or four months it would be the better, but there will be no occaſion to keep it moiſt all that time; for after it is brought to proper order and laid in a heap, it will require no further care until a day or two before it is wanted.

CHAP.

CHAP VI.

On the Soils proper for the different Kinds of Foreſt-Trees.

THERE is a proper ſoil for all kinds of trees in which they thrive, and moſt of the directions for planting ſtop there. The variety of trees would be confined to a very ſmall number, if the ſame kinds of trees did not thrive and grow in many different ſoils.

FOR the information and ſatisfaction of thoſe whoſe ſoil is not the beſt, and may be thought not to be fit for many kinds of trees, I have here added a liſt of the common ſorts of foreſt-trees, with an account of the different ſoils and ſituations they will grow and thrive in.

THE obſervations were at firſt taken from natural woods, and improved by following

lowing nature in many ſucceſsful experiments; ſo that if all the trees are planted and ſown in ſoils according to what is here mentioned, they will thrive; and if managed after planting as directed for pruning and dreſſing, will make very fine trees.

OAKS will thrive in clay if the acorn be ſown. They grow very ſlowly for ſome years, but they make fine trees, and are the beſt of wood. If planted from a nurſery where the land is good they ſeldom thrive, but grow ſtunted and crooked; but if planted from the ſeed-beds that are made to raiſe trees for poor land, they will grow very well, and after the firſt year ſhoot freely.

IN ſtrong loam they may be planted at ſix or ſeven feet, from the nurſery, and after the firſt year will grow very well.

IN light loam they may be planted from the nurſery or other plantations when of a

large ſize, and will grow freely even the firſt year.

In fat, rich earth they grow well at all ages, and make fine ſhoots; if the acorn is ſown in ſuch ground they make the fineſt trees.

In black mooriſh land, where long heath grows, they grow faſter, and have finer ſhoots than in any other. The acorn ſown thrives well in ſandy loam; but they muſt be planted young, or ſown; for if they are large they grow hide-bound and never thrive. Acorns ſown round the bottoms of hills will thrive and grow fine trees, although the ground be very indifferent.

Poplars of all kinds will thrive in bogs and all moiſt grounds; they will grow to a great ſize in good land, but the wood does not deſerve ſuch quarters, unleſs they are planted by way of ornament for the variety of their leaves.

The

Few woods more durable than Poplar, when kept dry -

THE American poplars are amazing faſt growers, and are beautiful trees, but the wood does not ſeem to be much better than the other ſorts.

ALL the kinds would anſwer well to be planted thick in moiſt grounds for coal-pit props, or where wood was much wanted for fencing of plantations and incloſures. The wood of late is much uſed in different kinds of huſbandry for its lightneſs; and ſome have made chamber-floors of it. The wood is of ſhort duration, and is not of value to make large plantations in any other grounds but wet places, where other wood will not thrive, and there they will turn to great profit.

THE Alder wood is of ſo little value, and the tree of ſo little beauty, that it is not worth cultivating in any place but mere bogs, where little elſe will grow. They may be propagated in ſuch places by large truncheons drove or puſhed into the ground.

ASH

Ash is a tree of great uſe and value; in good land they grow very faſt. A gentleman may plant Aſh, and ſee the ſame trees cut and ſold for three and four guineas each. It will grow in hard clay, but the wood is not very good; in ſtrong loam it will make fine trees; in light loam it grows amazingly faſt, and in fifty years after planting there will be trees of great value. It will grow very well in moiſt ſoils, but in hard dry ground the wood is not good; neither does it grow to a great ſize.

The Aſh is not eſteemed, becauſe it is long before it is green, and loſes its leaves the ſooneſt of all the foreſt kind. It is a wood much uſed in all ſorts of huſbandry work; ſo that there ſhould be a large plantation in good land, in a proper place that is not near nor much in view of the manſion-houſe, as they are very unſightly in ſpring.

Beech will thrive in all kinds of ſoils

that are not wet; it will grow amongſt hard rocks where there is hardly any ſoil; it will grow in clay, but there they ſhould be planted from the ſeed-bed, in the ſame manner as trees planted on poor gravel.

If they are planted from the nurſery at four years old they will do pretty well, but if they are much older, there will not be one in ten that will grow.

If they are planted in clay, or even in ſtrong loam, they ſhould have only the large ſide-branches taken off.

If they are trained in the nurſery, or taken from other plantations, and have been regularly dreſſed and pruned, they may be planted in good light ſoil, when they are large, with ſucceſs; but even then they ſhould have all the ſmall ſide-branches left on, for they do not thrive well when they are much diveſted of their branches. In the nurſery they ſhould not be much pruned.

It is a tree of great uſe, and very profitable to make large plantations of. The favourite ſoil of the Beech is a dry light ſoil, of a foot or eighteen inches deep, with a gravel or ſtony bottom, and a high ſituation: in ſuch ground it will grow very beautiful.

Birch will grow in any ſoil or ſituation, on the hardeſt rocks and in the ſofteſt bogs; thoſe on the hard rocks never grow to very large trees, but the wood is pretty cloſe; thoſe in bogs and wet land grow to large trees, but the wood is ſpongy, and the trees will not live to a great age; thoſe on middling land will make fine trees, and live to a good old age. The wood is tolerable, but is not of value to make large plantations of, unleſs where coal-pits or forges are near, to both which they are of great uſe.

They are alſo very beneficial to make common railing for fencing on waſtes and commons that are planted or taken into

tillage, becauſe they grow very ſtraight and long, and are eaſy to ſplit when too thick. A plantation of them planted very thick on moiſt ground that is tolerably good would be advantageous, as they would grow very faſt and ſtraight, and would be ſoon fit for many uſes.

THE favourite ſoil of the Birch is a light black earth, of a foot deep, and a gravel or ſtony bottom; in that they will grow tall and ſtraight, with a remarkably white bark and fine heads.

THE Horſe-Cheſnut will thrive in all ſoils where there is a moderate depth of earth, and a gravel or ſtony bottom; there they will grow to a great magnitude. The leaves are handſome and the flowers are beautiful, but the wood is of no great value, ſo it is only fit for pleaſure.

A FEW clumps in the ſkirts of plantations are very pretty. They ſhould never be planted near walks nor houſes, as they make

make a conſtant litter from their firſt budding until the leaves are all gone. It is a tree not fit to plant for profit.

THE common rough-leafed Elm will thrive in moſt ſoils but hard clay and ſtanding water; yet it will thrive by river ſides, where the ſoil is light and ſandy (as it generally is) although the roots are three parts waſhed bare by the water; but the wet is only temporary and goes off ſoon. It is an excellent foreſt-tree, and is of great utility both in the huſbandry way and cabinet work; and it has this advantage over all the other kinds of Elms, that it will thrive very well in indifferent ground. Its favourite ſoil is a light black earth, of a looſe nature and a hard bottom; in ſuch a ſoil the roots will run a great way, and the trees will grow to a great ſize, and be very ſtraight, if planted thick.

THEY are raiſed from ſeed and from layers; many prefer the ſeed, but if the layers are rightly managed there is little

difference, if they are moved once or twice in the nurſery: they may be planted out from thence, or from other plantations that have been properly managed, after they are large, with good ſucceſs. It is an excellent tree to make large plantations of, and will turn to great profit, as it will thrive ſo well on very indifferent ground.

THE Dutch Elm is a tree that grows very faſt when young, if the ſoil be good; and as it ſhoots immenſe quantities of ſide-branches, they require a good deal of labour to keep them in order. It likes a good depth of ſoil, a good rich loam; there it will thrive and grow very faſt for twenty-five or thirty years, but after that time it generally is at a ſtand, is ſtunted, and makes no figure; the bark grows rough, and the wood is of little value, ſo large plantations of them would not be very advantageous, eſpecially as they require good land, which may be better employed.

THE Engliſh Elm is the moſt beautiful of all the foreſt kinds, and grows to an amazing great ſize. It will grow in a ſtrong loam where there is a good depth of ſoil above the clay, which is generally the bottom where the top ſoil is a ſtrong loam.

AS all theſe trees are raiſed from layers, they ſhould be trained in the nurſery for ſome time before they are planted out: if they are properly managed, the roots will be ſo trained as to run horizontally, and if they are ſo ordered, they will grow to very ſtrong trees in a ſtiff loam; for after the roots are flat they will run along juſt below the ſurface, and never attempt going into the clay, which is a great enemy to them, for they ſtunt as ſoon as the roots touch it.

THEY will thrive very well on a light black earth, and on light loam that is of a moiſt nature they thrive the beſt of all: ſuch loam has always a ſandy bottom; and

although the Elms are trained ſo that their roots are quite flat, and the large ones as they extend run juſt below the ſurface, there will be many ſmall roots a great depth in the ſand. They will thrive ſurprizingly in ſoft ſand, but then they ſhould be planted young and pretty deep.

THEIR leaves are not of that dark green when in ſuch ſandy land; they loſe them ſooner in autumn and are out earlier in ſpring. It ſhould be obſerved, that their ſituation be on the loweſt ground, that the moiſture may fall to them; for although they do not love to ſtand in wet, yet they like a good deal of moiſture, and they always thrive beſt in that ſituation.

IT is a tree very fit to make large plantations of, as the wood is very valuable, and will turn to great profit, if the ſoil be proper and of a good depth; but on poor land and ſhallow ſoils they thrive the worſt of any of the foreſt kind.

THE

THE Witch Elm is generally miſtaken for the common rough-leafed Elm, which grows wild in moſt woods, and is fine wood; whereas the Witch Elm is a ſoft ſpongy wood, not much better than a Sallow, and grows almoſt as faſt: it grows very tall, and ſmall in the bole to its height. It will thrive in an indifferent ſoil if it is pretty deep; it grows beſt in a good light loam. It is only fit for hedges, to cover arbours, or (planted very thick) to cover old walls in ſummer, or any other diſagreeable object, for all which it is very fit, as its branches and leaves are very thick. It is not worth cultivating for any other uſe.

THERE are ſome other varieties of variegated Elms that are for beauty and ornament in pleaſure-grounds, but of no great value as foreſt-trees, ſo are of no conſequence at preſent. They are propagated from layers, and budding on the common rough-leafed Elm. They require a good deep ſoil, and not too rich, or they loſe much of their beauty.

The Lime tree is a very beautiful growing tree, and is very fit for ſhady walks and clumps for ornament, but, like the Horſe-Cheſnut, makes a conſtant litter, which is the reaſon it is not now in much eſteem. Its wood is ſoft, and of no great value, but for carvers and ſuch trifling works, ſo is not a fit tree for large plantations. It will thrive in ſoft ſand, and any light ſoil that is dry: its favourite ſoil is a ſandy loam, in which it will grow to a great ſize, and if it has room to ſpread will be very beautiful.

The Sycamore is a fine growing tree, and the wood is of great uſe for turners, and many other things in the furniture and huſbandry way; it is alſo a very ornamental tree in plantations, and in clumps where the ground is fit. It thrives beſt in a ſandy loam; it grows very well in all light dry ſoils that are of a moderate depth. It is worth propagating for profit, where the ſoil anſwers.

THE common Maple will thrive in all poor dry grounds, even where there is but little earth: it is a wood of no great value, and ſeldom grows to a great ſize, and is not fit to make plantations, neither for profit nor beauty; it is very good for to convert into under-wood, as it ſhoots very ſtrong and very quick from the ſtools after the firſt cutting.

MAPLE (the Norway) is a good tree, the leaves are handſome, and make a fine ſhade: the wood is much of the ſame nature with the Sycamore, and will thrive in all the ſame ſorts of ſoils. It is a very good tree to plant for uſe.

THE Mountain Aſh is a very handſome tree; the leaves, flowers, and fruit are all very pretty: the tree grows to a good ſize, but the wood is of no great value. The leaves and flowers make a very beautiful appearance in ſummer, and in the autumn, when the fruit is ripe, they are of a fine red colour. If three or four are

planted in little clumps in different parts of the plantation they would be very ornamental; it is not a tree to plant for profit. It will grow in very poor land, and thrives in moſt ſoils, even amongſt rocks and in ſtiff clay.

LABURNUM (the Scotch) is one of the moſt beautiful trees of the foreſt kind; its bark is remarkably green, with a fine ſhining leaf, and when in flower is all over a bright yellow. It grows to a great tree if planted in good, light, rich earth; it will thrive in all light ſoils that are moderately deep.

IT is a very valuable wood, and will yield great profit to make large plantations of, if near a great town or convenient for water-carriage, as it is too beautiful a wood to uſe for any work but the cabinet buſineſs.

FOR clumps in pleaſure grounds, Laburnums and Birches would be very beautiful,

as

as the bark of the one is white, and the other a dark green: they are both much of the ſame growth as to height, and both their leaves are very fine.

The Spaniſh Cheſnut will thrive in all good ſoils that are not wet; it will grow in ſandy loam, and in very poor dry ground; but then it muſt be planted young, that is, from the ſeed-beds, as directed for planting poor land: it may alſo in ſuch ſoil be propagated from the nut. It makes a fine ſhade, grows to a very large tree, and is a good durable wood: it is uſeful for all kinds of country buſineſs, and is valuable to make large plantations.

It may be objected that ſowing the nuts or tree-ſeeds on poor land is contrary to the directions given for planting poor land, and the reaſons that are given for its being done in that manner are, that all ſeeds *ſown* go down with a tap-root, which they certainly do if the ground is good, or if even it is a hard clay; but in gravel or ſtony ground the tap-root cannot get far

before it meets with ſome obſtruction and is turned aſide, after which it ſpreads and runs amongſt the ſtones and along the top of the gravel, as may be ſeen in natural woods.

TREES that have been ſelf-ſown in ſtony ground, their roots run many of them on the top of the ground; or if they are covered when young, when they grow large they riſe above the ſurface, ſo that moſt of the roots are ſeen above ground, and they run the ſame as if they had been planted and laid horizontally; ſo that planting and ſowing in bare ground is no ways contradictory.

THE Walnut: its proper ſoil to plant in is a fine, rich, light, black earth of two feet deep (if it can be had) with a gravel or ſtony bottom; in ſuch ſoil the trees will grow to be very large and bear great quantities of fruit, and very good. It will thrive on a ſtrong loam, if there be a good depth of it, but it will not bear much fruit, and what there is will not be good. It will

will grow very well in a ſandy loam, and bear great crops of fruit, which will be ſmall, but very good.

It will grow and thrive very well as a timber-tree on all deep ſoils, although inclining to clay, but will bear very little fruit, and thoſe will not be very good. It is a wood of great value, and in proper ſoils no tree yields more profit. It is a too beautiful wood to uſe in any buſineſs but furniture and ornamental works, ſo that if they are not near a market it leſſens their value, which ſhould always be conſidered where timber-trees are planted for profit.

Cherry (the common Black or Wild) is an exceeding good foreſt as well as fruit-tree, and in places where diſtilleries are near, their fruit yields great profit. It grows to a great ſize in all kinds of good ſoils, and will bear fine fruit equal in flavour to the fineſt cherries. It will thrive in very indifferent ground, provided it has a dry bottom

bottom (for wet is a great enemy to it) but the fruit will be ſmall. In ſuch ſoils it ſhould be planted from the ſeed-bed, as directed for poor ſoils.

It will grow in all ſoft moiſt ſands, and in ſtrong loam it will grow to a great tree, but the fruit will be hard, dry, and bitter. It is a tree that will thrive in almoſt any ſoil but where there is ſtanding water. It is very beautiful when in bloſſom; ſome clumps of them properly placed in large plantations would add great dignity to the whole; and as the wood is very valuable, they deſerve to be encouraged in all plantations.

Platanus or Plane-tree (occidental and oriental) are two ſpecies differing only in the ſhape of their leaves; and as botanick diſtinctions are no part of the plan of this work, but plain and eaſy directions how to manage and bring to perfection all the kinds of trees mentioned, I ſhall claſs them together, as their wood and culture

are

are much the ſame. They are very beautiful, have fine leaves, and grow to a great magnitude. There have not as yet been any large plantations made of them, but there are many fine trees growing in ſeveral parts of England.

THE wood is much the ſame as that of the Sycamore, and they will thrive in much the ſame kinds of grounds; but to have them grow to perfection they ſhould have a good, rich, deep loam, not too ſtiff; in ſuch ſoil they will grow to an enormous ſize, and when ſuch a ſoil happens in a plantation, ſome clumps of them would add greatly to its beauty.

THE Hornbeam is much of the nature of the Beech, and will thrive in all the ſame ſorts of ſoils. I can aſſign no other reaſon for its being generally neglected in plantations, than that the Beech is a much handſomer tree, and grows much ſtraighter in the ſame kinds of ground and ſituations. The Hornbeam, if planted thick, will grow

very ſtraight and tall, and make a fine tree. There is no wood fitter to cut down for under-wood; it grows very quick and very thick.

THE Crab is a tree that grows to no great ſize, and large plantations of them would not be prudent. They are a fine, hard, durable wood, and are uſeful, eſpecially for many things belonging to Mills. It has the fineſt bloſſom of all the flowering kinds, and a few of them properly diſpoſed in a large plantation would be very beautiful.

THEY thrive beſt in a good rich loam, and there will grow to a pretty good ſize; they will alſo grow in very indifferent ſoils that are dry. If they are planted thick they will grow tall and have fine ſtraight ſtems; but their greateſt beauty is their fine ſpreading heads, ſo if they are planted for beauty they ſhould have room to ſpread.

THE

THE Larch tree is a very beautiful plant, and makes ample amends for its not being an evergreen, by its fine appearance in the ſpring. Moſt plantations of them that have been planted are in low grounds, good land, and warm ſituations, which is very wrong; for in ſuch places they grow too faſt, like a plant that is drawn, under glaſs, for want of air. Such places are not their proper ſituation: as they were of foreign growth, it was imagined they were tender, which they are not.

THEY are very hardy, will reſiſt the greateſt cold, and will thrive exceeding well in high ſituations, and in very poor land, and there will grow to fine large trees and good wood, which they never will in rich ſoils; for they grow ſo faſt that they cannot ſupport themſelves, and ſo are always crooked. If deſigned for wood, they ſhould be planted in clumps pretty thick, for they ſpread prodigiouſly when they have room or are detached, or planted promiſcuouſly amongſt other trees, which

they overgrow in a little time; this has been the common practice in planting them.

THERE is no tree they can be mixed with to ſucceed but the Mountain Pine; they are the moſt agreeable companions, for they are inhabitants of cold high mountains, and in ſuch ſituations will grow very equally.

THE Larch will thrive in any ſoil or ſituation; it will thrive very well in a ſtrong clay, and I have ſeen them growing very freely where one third of their roots were in the water. This was in an iſland, the ſurface of which was not a foot above the level of the water, and of conſequence moſt of the roots were in wet ground; ſo that they may be ſaid to grow in any place where there is mould for them to ſtrike root. If they are planted in clay they ſhould be planted in the ſame manner as trees on poor gravel. They ſhould never be removed when they are large, for they

thrive

thrive badly for ſome years if they grow, which is very hazardous, although they are taken up with large balls.

I HAVE been told that the wood is very good (but there are no trees come to proper age in England to judge of its goodneſs) and that it hardens in water; for if it is always wet, it will laſt for hundreds of years; which, if true, it would be worth propagating, if only for the uſe of waterworks.

THE Common Spruce, the Norway Spruce, the White and Black Spruce, are all different ſpecies of the ſame tree, and the ſame management and culture will anſwer to bring them to perfection. They are all fine trees and grow to be very large, and when our plantations of them come to maturity, we ſhall have as good wood as any that is brought from Norway or any other part of the globe; and as there are great quantities of ground fit for their growth that is of little value, they ſhould

be cultivated with great care and induſtry. They will thrive in poor gravel and ſtony mountains; on ſuch ground they ſhould be planted from the ſeed-bed, two years old.

In marſhy, mooriſh ground they will come to great perfection, as in ſuch places the ground is wet and the ſoil deep. It would be beſt to plant them when a foot or two high; that is, plants that have been removed from the ſeed-bed into the nurſery, and have ſtood two years. They will even grow in wet moſſes, but there the trees ſhould be four or five feet high, and the beſt for that purpoſe are trees that have been ſome time planted, and growing on hard bare dry grounds.

They may be planted at firſt at ſix feet diſtance, and ſhould not be moved until they meet, and then every other tree ſhould be taken up and planted in other places; thoſe taken up in the hard dry ground will be very fit to plant in the wet moſſy

grounds, and the proper ſeaſon for planting them is the laſt week in March or the firſt week in April.

THE trees taken from the hard dry ground, their roots will be ſhort, tufty, and ſmall, none of which ſhould be cut, but planted again as ſoon as poſſible, and it would be right to plant them a foot higher than the level of the ground, if it is very wet; they will ſtrike root and grow immediately, and will have good hold before winter, and then the wet will not hurt them. As the trees are large that are planted in the marſhy and moſſy ground, they may be planted at twelve feet diſtance at firſt, ſo they will require no further trouble.

SILVER Fir is a beautiful tree and grows to a great magnitude, but muſt have better ground than the Spruce. If it is planted in a light black ſoil, after the third year from the ſeed, it will grow very faſt; it will thrive in light loam, and will grow

in ſandy loam, but not to a great ſize: it makes a handſome detached tree, and will ſpread its branches a great way, and will be very ornamental. If a plantation for timber, twelve feet will be ſufficient, and they ſhould be planted in large clumps.

I HAVE ſeen Silver Firs of ſixty years old that were almoſt a hundred feet high, and thick in proportion. The ſoil was light and fine, not much more than eighteen inches deep, and not very rich.

THE Pinaſter is not much different in its appearance, at a diſtance, from the Scotch Fir, and while young they ſeem to be much the ſame; but as there is no plantation of them old enough to try the goodneſs of the wood, it cannot be determined if it is any better than the wood of the Scotch Fir; it is equally hardy, and will thrive in the ſame ſoils and ſituations, and may be planted round the ſkirts of plantations to ſhelter other trees.

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THE Swamp Pine has only this advantage over the others, that it is ſuppoſed to grow in wetter places than them. As to its wood and beauty, it is, to view, not much different from the Pinaſter, is as hardy a tree, and will thrive on hard dry ground as well as in bogs. The Scotch Fir will grow in very wet ground.

THE Mountain Pine (commonly called the Scotch Fir) is what we are beſt acquainted with, and is known to thrive in poor gravel, rocky mountains, and in all kinds of ſoils and ſituations; but in low ſituations and good land the wood is not ſo good as when the ſoil is but indifferent and the ſituation high, which makes it valuable.

I KNEW two plantations of Scotch Firs that were planted at the ſame time; ſixty years after they were planted they were cut. The one was on a riſing ground, which was ſhallow and very poor; the other was on a low ground, which was ſtrong, and all the winter covered with water: that

on the low ground the trees were in general four inches more in diameter than those on the rising poor land, but the wood was not so good, it was white and spongy; the other was firm and of a good red colour, and of much greater value.

The Weymouth Pine is the beautifullest of all the Pine kinds, but is tenderer than any of them; by the growing of the wood it seems to be finer than any of the others, but as yet there have none been cut of a sufficient age in England to know its goodness; neither have there been many large plantations planted of them, for what has been planted are mostly for pleasure, and most of them in good ground and warm situations, where they have throve very well: they will also grow in indifferent soil, but should be sheltered from the north and west winds.

CHAP.

CHAP. VII.

On American Foreſt-Trees.

MOST of the common kinds of foreſt-trees in England have been treated of, and the manner of propagating and bringing them to perfection; but there are numbers of American tree-ſeeds brought over every year and ſown in England, many of which are fine plants and promiſing.

IN the year 1772 I had a collection of tree-ſeeds from America, amongſt which were many ſorts of Oaks, which were ſown in very indifferent ſoil, but a warm ſituation; moſt of them grew very well, and made ſhoots much ſuperior to what I expected in ſuch ground.

THE woods in America are, in general,

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on very rich, fine, deep ground; and by a gentleman who was very curious in planting and obſerving the progreſs of the growth of wood, and who had reſided many years in America, I was aſſured that trees of all kinds, in that country, grew as much in one year as they did in England in three. He alſo affirmed, that if a wood was ſtubbed, and brought into corn, and kept ſo for ſome time, and then laid into graſs, in a few years it would be all a wood again.

It is well known that it is not ſo in England; for if a wood is deſtroyed and taken into corn, and kept for that uſe for ſome years, when laid into graſs, if it continues never ſo long in graſs, there grow no timber-trees; thorns, broom, and furze will grow, and cover a field in a few years, if not prevented, where ſuch ſhrubs are near, and even ſometimes where there is no ſuch thing, but that is eaſily accounted for, as the wind and birds may and do carry the ſeeds; but timber-trees never

grow

grow there, unleſs a wood is near that has trees bearing ſeeds, which may ſcatter their ſeeds there as well as in any other field.

I AM far from being againſt the introducing and propagating of foreign trees, as many of them are great beauties; but I would not have planters be too ſanguine, and plant large plantations of foreign trees on the recommendation of foreigners, for all or moſt nations are partial to their own country, and recommend the produce as far ſuperior to what they ſee in other places, without conſidering what it is that makes the difference.

IT muſt be many years before the goodneſs of the wood can be determined by young trees raiſed from the ſeed and planted in England. The beſt method would be to procure ſome wood that has come to maturity in the country the ſeed comes from, and of the ſame kind, and it would be neceſſary to know what kind of ſoil

and

and ſituation the wood grew in, for the ſoil alters the wood very much.

If the wood is good and fit for any particular uſe, then it would be worth the while to plant the foreign and ſome Engliſh trees of or as near the ſame ſort as poſſible, in the ſame ſoil and ſituation, in clumps, the trees planted alternately; this would be a fair trial as to growth: then it would be right to conſider whether this foreign wood is better than the Engliſh that grows on the ſame ſoil; if it is, and grows faſter, it is a great acquiſition, and fit to plant for profit.

Some years ſince I raiſed from ſeed the American and the common Spruce Fir; the American grew taller the three years they were in the nurſery, but not ſo ſtrong as the common: they were then planted into little clumps in a rich light loam. The firſt year neither of them made much progreſs, although they were taken up with good balls of earth, and were not a quarter of an hour out of the ground.

THE ſecond year the American made a ſhoot of two feet long; the common a ſhoot of fifteen inches, but near twice as thick. The third year the American ſhoot was much the ſame; the common twenty-two inches and very ſtrong. The fourth year the American kept ſtill to two feet; the common gained an inch. They both grew much the ſame for many years; the American was the talleſt, but the common was much the ſtrongeſt plant.

THERE were the ſame year, and near the ſame time, ſome planted on a dry, poor, ſandy ſoil. They both made very poor ſhoots for ſeveral years, but the common was the beſt, and of a much darker green.

I HAVE taken notice of this difference, becauſe moſt that have wrote on planting, of late years, greatly recommend the American kind of trees, as being of a much quicker growth than the ſame kinds that are Engliſh; that is, that an American

Oak,

Oak, Aſh, Beech, &c. will grow much faſter than an Engliſh Oak, Aſh, or Beech.

I HAVE at this time Oaks of different kinds, Aſh, Beech, and Birch, from American ſeeds, and the ſame ſorts that are Engliſh, growing in the ſame nurſery; there are ſome of both ſorts that make long ſhoots and ſtrong; and in many of them there is no material difference. I believe it is more from the richneſs of the ſoil than from the trees, that cauſes the great difference in the growth of wood in England and America.

THERE are many kinds of American oaks that have been raiſed from ſeed ſome years ſince in England, and are planted out, and are fine thriving trees, and grow much faſter than the generality of the Engliſh; but as they were new trees, and greatly recommended for their beauty and quick growth, they were ſown in the beſt

beſt ſoils, and planted with all care in the warmeſt ſituations.

But if they had been planted in ground of leſs value, perhaps they would not have grown faſter than the common Engliſh oak; and if they did, it would be very material to know if the wood was equally good, for the quantity will not make up for the quality, if it is of an inferior nature.

Every one knows that all the kinds of foreſt-trees we have in England, that are of quick growth, their wood is of very little value, as poplars and willows of all kinds; but there may be ſeminal varieties in ſeedlings of all kinds of trees, as the quality of the wood may be equally good and yet grow much faſter; for in large plantations of all kinds of trees there will be many that will ſhoot as much in one year as the generality of the plantation do in two or three, where there is not the leaſt viſible difference in the ſoil.

WHETHER this is owing to a ſeminal variety, or to ſome ſuperior quality in the ground where ſuch plants are planted, I do not pretend to determine; but if, upon the niceſt obſervation, there cannot be diſcovered the leaſt variation from the others that grow ſo ſlowly, I think it would be ſurprizing if it proceeded from a change in the ſeed, but rather from ſome hidden quality in the ſoil.

THOSE that are curious in trees, when they obſerve a ſeedling-tree that is remarkably different, and has ſome good qualities which they would wiſh to preſerve, the beſt method is to convert it into a ſtool, and raiſe plants from layers (for all foreſt-trees will grow from layers) which is a more certain method than grafting; for all trees partake ſomething of the ſtock they are grafted on, as can be eaſily proved from the dwarfiſhneſs of the apples grafted on paradiſe ſtocks, and pears on quinces, with many others.

THOSE

THOSE that are accurate in botany can diſtinguiſh many ſpecies from ſeedlings, ſown at the ſame time, of any kinds of trees or plants; and it is owing to their ingenuity and diſcoveries that makes us poſſeſſed of ſo great a variety of beautiful plants of all kinds.

THE only difficulty in ſeedling-trees is to know which is the beſt wood; as in all kinds of ſeeds ſome improve, ſome degenerate, and many keep to their kind. But when there are many viſible differences in plants from the kind that was ſown, there is no doubt but the very nature is altered; and although they may ſeem to be improved by being more vigorous than the others, perhaps the wood may be much inferior.

IN flowers and other inferior plants, their goodneſs is ſoon diſcovered, and in general (eſpecially in flowers) the ſtrongeſt and freeſt growing are the worſt; but in trees it will be a long time before it can be

known, not before the trees are fit for cutting; for there are many kinds of wood which is good for nothing until it comes to its proper age, which is then very good; and many kinds that are pretty good when young, but when old are good for little.

For which reaſons it will not be prudent to plant large plantations for profit with trees, let them be never ſo well recommended, until the goodneſs of the wood is well known.

I have been informed by ſeveral gentlemen that have been many years in America, that in the large and fine growing woods there the ſoil in general is a fine light loam of a great depth, ſuch as is in our valleys by river ſides, and are perfectly dry.

If a large plantation was made on ſuch ground in England (for if there are only a few trees planted they will never make fine timber) and if the water does not lay

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on it in the winter, which is often the caſe, they would grow very faſt and be fine trees. Some years ſince I made a plantation on ſuch a ſoil, which was not liable to be wet in winter.

THE plantation was moſtly the Engliſh oak; they in general made ſhoots two feet long the ſecond year after planting; the ſhoots were proportionably ſtrong. They continued to grow very quick, ſo that in a few years they were ſuch large and fine trees, that none who ſaw them would believe but they were much older.

THERE are now growing at Lord Downe's at Cowick, in Yorkſhire, what are there called the large American oaks; they are growing in ſmall clumps; they are about thirty years old; the moſt of them are fifty feet high and upwards, two feet diameter at bottom, fine ſtraight ſtems, clear bark, and grow freely.

THE ſeeds were ſown where they are

now growing; they were kept clean and dreſſed carefully for ſome years. There are no Engliſh oaks growing near them; if there had, I am of opinion they would have been as large as the Americans, for there are ſome Engliſh elms growing near them which are much larger; which makes me believe it is more the ſoil than the kinds that makes the quick growth of trees. His lordſhip's park is a rich, light, deep loam, and a warm ſituation.

CHAP.

CHAP. VIII.

On the Management of grown Wood.

ALTHOUGH the intention of this publication is only for the planting of poor lands, and converting them into profitable foreſts, as ſuch ground is of very little uſe and of no value, it cannot be ſuppoſed that trees on ſuch ground will ever grow to the perfection and ſize of trees on rich ſoils; ſo that every gentleman of landed property ſhould allot a few acres of good land for planting for the good of poſterity, and the advantage of his country.

IT will not turn to the planter's immediate profit; but there are few of that parſimonious diſpoſition who will do nothing for futurity, who are really gentlemen; and all thoſe that are lovers of trees, as

moſt gentlemen are, their pleaſure in ſeeing them grow will be very great, and give them more joy than any other amuſement. *Theſe are trees of my own planting* are words I have often heard repeated with great content and gladneſs.

ALTHOUGH I have treated a good deal already on the thinning of plantations on good land, I muſt again repeat a caution. The methods of planting good land is ſkilfully and plainly taught by many able authors, ſo as to want no inſtructions but ſome cautions.

PLANT thick and prune carefully according to the directions given for pruning, and juſt when the ſide-branches begin to meet remove every other tree, for if they ſtand until they are become a thicket, it makes them tender for want of free air, and when expoſed are in danger of being loſt. The removed trees ſhould be planted in large clumps, or in a new plantation; for trees from ſuch places

ſhould

ſhould never be planted as detached trees, nor in ſingle rows.

THE trees that are taken up muſt not by any means be diveſted of all their ſide-branches, as is often practiſed; for if they have been well managed, they will be ſtiff and ſtrong, and very able to ſupport themſelves with the ſide-branches on; they keep the trees warm, and encourage their growth greatly; whereas, when taken clean off, the top or leading ſhoot grows very long even the firſt year after planting, and always ſo weak, that it is not ſtrong enough to ſupport itſelf, ſo grows crooked; but where many or all of the ſide-branches are left on, it grows not ſo much in length, but quite ſtrong and upright.

IT is owing to the ſtripping of young ones that there are ſo many crooked trees in plantations that are planted from nurſeries with trees eight or ten feet high.

I HAVE planted trees twenty feet high

with ſo many of the ſide-branches on, that by the middle of ſummer it would have been very difficult to know at a little diſtance, but that the trees had been growing in that place ſeveral years.

If trees that are very tall and have ſtiff boles are to be removed, if they are ſtripped (which is very often the caſe) of all their ſide-branches, they grow to a great buſh at top, and are in danger of being broke; but if there had been many large branches left pretty thick on the bole, the tree would bear the wind much better, as it would then have all bent equally, been in no danger of being broke, and made a finer tree.

The difficulty of planting trees that have been a long time in a thicket, is, that they have very few ſide-branches, and thoſe that they have are very long. They ſhould be ſhortened to two feet long, and the top, which is generally very buſhy, ſhould be thinned by cutting out ſome of

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the largeſt cloſe to the bole, and ſhortening the others gradually, ſo as to draw the tree to a leading ſhoot.

But it is bad planting them; for as they have been ſo long deprived of free air, and been very warm, they are in great danger of being loſt, ſo that it is only in caſe of neceſſity they ever ſhould be planted; and when they are, the only place is in a wood, where there is a large vacancy by a tree's being dead, or cut out for ſome particular uſe. There they may ſucceed, but hardly any where elſe.

In ſuch places they are of great ſervice, and it is difficult to find trees that are tall enough but from ſuch thickets, and there they are in no danger of being ſhaken by the wind, as they are protected by the trees all around.

If the vacancy is large, that is, forty or fifty feet diameter, which is often the caſe where a large tree has been cut out, it would

would be right to plant four or five in the middle pretty close; for it would be to no purpose to plant within twenty feet of the side, unless the tree that is planted is taller than the trees that are growing round the vacancy.

It is a common practice in natural woods to cut out trees for particular uses: this is very wrong; for it would be of more advantage to the owner to purchase what wood is wanted, even at a very dear rate, than mangle his wood; for if the wood was not well managed when young, it is probable the cutting out of a large tree may make a gap of twenty or thirty feet.

No young tree can be got up even in that great space, for the trees that are round will spread their side-branches, which were kept up by the tree that was cut, and in a few years will meet; so that if even a tree from some other place was to be planted in the opening, unless it was

higher than the trees round it, it would ſoon be over-hung and deſtroyed; ſo that there is not the leaſt probability of any ſhoots that come from the ſtool of the tree that was cut off ever getting up ſo as to come to perfection, even although all the ſide-branches of the ſtanding trees were cut, which would be a great detriment to them, more than the value of the planted tree, even if it ſhould thrive very well. It is owing to this bad practice of cutting out trees, that there are ſo many crooked trees in natural woods.

THERE is another great objection againſt the cutting of trees in grown woods. There are generally cattle allowed to feed in them, and if the owner cauſes fences to be made round where the tree was cut, to ſave the young ſhoots (which I have ſeen) they are little regarded after the firſt making; and indeed if they were it would be to little purpoſe, for if the young ſhoots were never ſo well preſerved, before they could come to any height

the

the place is quite clofed at top, and they grow crooked, unfightly bufhes.

If the wood is come to its full growth, and is to ftand fome years, it is a great lofs; for when the whole of the wood is felled, the fhoots from the tree that was cut before will be fo bent by the overhanging of the trees, that they will be fo crooked as to fpoil many of the young trees round them, if they are not cut down, and if they are, it is wafting the ftool to no purpofe.

If the wood is fit to cut, and is left becaufe it is beautiful, and the owner has no mind to part with it, the vacancy muft either remain empty or be filled with a crooked bufh, which are fufficient reafons to put an end to that bad practice.

If a little wood is wanted, let fome corner that is moft out of fight be cut down and afterwards planted, or the ftools managed as before directed, and then there will

will be woods both beautiful and profitable. No gentleman ſhould allow their woods to be cut and mangled, as moſt of them are in the north.

It is a cuſtom when oak woods are cut to leave many ſmall trees, which is a bad practice; for if the wood was thick and good, as it ought to be (and would have been, if well managed when young) theſe ſmall trees will have long ſlender boles, and are very liable to be broke by the wind; if they ſhould eſcape being broke, they are often ſo twiſted and ſhaken, that they never make good wood. If they ſhould meet with none of theſe misfortunes they will grow to great buſhy heads, and over-hang many of the young trees.

When a wood is cut, if there are any ſtiff young trees, and four or five of them can be left in a clump, it will anſwer very well, and they will grow fine tall trees; but if they are left detached they will grow no taller. If they meet with no mif-

fortunes (for they are liable to many) ſo that they grow fine trees, they will take up a great deal of room, for nothing will grow ſtraight that their branches overhang.

EITHER in natural or planted woods the trees may ſtand ſo thick as eight feet diſtance, if the natural wood is managed with care after cutting, and the planted wood carefully pruned for a few years after planting.

THOSE that are fond of pleaſure or profit can have no proſpect ſo agreeable as a well-dreſſed wood, where the trees are tall and ſtraight, and not a foot of ground loſt, the trees growing in a regular pleaſant form, which is agreeable even in winter to walk in, and in the ſummer is a pleaſant ſhade; at a diſtance it is a beautiful carpet in the air, far ſurpaſſing the moſt elaborate works of what are called pleaſure-grounds. All this may be accompliſhed by following the directions before given.

I MAKE no doubt but it will be very agreeable to all or moſt gentlemen to blend pleaſure and profit, provided it can be done without expence, and at a very little loſs.

THERE are ſome trees that are of little value, but very beautiful: if ſome ſmall clumps of them were interſperſed in a plantation with taſte, they would be very ornamental, and the little room that ſhould be allowed them would not be a great loſs, as they would be of ſome value when cut, and a great beauty when growing.

THIS may be done in all plantations, even in the pooreſt barren ground; for the moſt beautiful of the flowering-trees will thrive in the very pooreſt dry ground and coldeſt ſituation.

IF the plantation is on a poor heath or barren hill where there is little ſoil, there may be planted clumps of hollies and

tree-box; for although they are not flowering-trees, they are beautiful ever-greens, and will grow to a great ſize in poor dry grounds. The mountain aſh and crab-tree will alſo grow in ſuch places: if theſe four are properly planted they will be ſufficient to add great beauty to a plantation that is ſeen at a diſtance.

THE hollies ſhould be planted at four feet diſtance to prevent their buſhing and to make them grow tall; there may be ten of them in a clump.

THE trees round them ſhould be at ten feet diſtance at leaſt, as they are ſlow growers for ſeveral years; then at ſome hundred yards, according to the largeneſs of the plantation, three or four crab-trees, which ſhould be planted at ten or twelve feet diſtance, that they may ſpread and have large heads. The trees round them ſhould not be too cloſe to them, at leaſt ten feet diſtance, as it would draw them up and ſpoil their beauty; then ſome

tree-

tree-box, which ſhould be planted thick to make them grow ſtraight and tall. None of the clumps ſhould be planted in rows, but as irregular as poſſible.

To beautify plantations on good land the ſame trees ſhould be recommended, with the addition of horſe-cheſnut, common black cherry, ſilver and ſpruce fir, (if no part of the plantation is planted with them). Plantations thus planted will make fine pictures at a diſtance, and give joy to the beholder, and pleaſure to the owner: they will have a chearful, agreeable look.

These clumps ſhould not be too numerous, ſo as to look like patches, but be planted at a great diſtance, and placed ſo as to add beauty to the whole foliage, for nothing is ſo diſagreeable, nor hurts elegance ſo much, as plantations planted in little patches. Large clumps of a ſort are noble and have a pleaſant look: the light green of the box will add beauty to the

gloomy fir; and the ſhining dark green of the holly will make the fine green of the larch ſtill more cheerful.

If woods, hedges, and fields were managed as they ought to be, the whole country would be a delightful garden. The expence would be trifling conſidering the advantage, for they would grow much better; and as all gentlemen that are fond of real rural ſcenes (and I believe moſt are) ſhould have the grounds in their own occupation in ſuch order, that every wood ſhould be a grove (inſtead of a heap of rubbiſh over-grown with thorns and briars); every graſs-field a lawn, only detached by a clean fallow, or a good crop of grain, to diverſify the ſcene. And there might be ſome art made uſe of, by decorations of evergreen, and detached trees and ſhrubs at proper places, to add beauty to the whole.

Even in plantations that are converted into under-wood, where all ought to be a thicket,

a thicket, there might be ſome ſmall ornaments made round the outſides, ſuch as ſmall clumps of hollies, laurels, and flowering-ſhrubs; which may be ſo placed as to be ſeen by ſurprize, and not as if they had been deſignedly planted.

CHAP. IX.

On Fences, and their Management.

HEDGES are the moſt uſeful as well as ornamental things belonging to a country; but the method of managing them, in moſt countries in England, is very erroneous. There is an old common tract of ſcouring and laying them when they are grown ſo bad as to be of little uſe.

THE method of planting them is much the ſame, without conſidering the nature of the ground, whether it is wet or dry, a ſtrong clay, ſand, or poor gravel. To have good hedges it would be right to plant them in very different ways.

THERE will be many objections made by the country-men in general, as it would put them out of their old way; but let any

any gentleman or farmer only try, and they will find it turn to their advantage.

BEFORE I begin to give directions for the planting the hedges, it will be neceſſary to give ſome inſtructions concerning the raiſing the plants.

THE berries are in general too ſoon gathered; they ſhould not be pulled before the leaves are all off the trees. When they are gathered, they ſhould be thrown into a heap, and lay for ſix weeks; then they ſhould be buried in a pit that is quite dry, and ſhould have an inch of ſifted coal-aſhes in the bottom, and then a layer of berries, and then of aſhes, until all is finiſhed.

THE pit ſhould be raiſed a foot above the level of the ground, and a ſmall trench made all round to prevent the wet getting into the pit. Coal-aſhes is better than ſand or mould to mix with the berries, as

it prevents all mouldineſs, and hinders mice from deſtroying them, which often happens.

THE berries which are gathered when the leaves are on the trees, will grow, but as they are not then full ripe, many of them will mould and rot; and thoſe that grow, will not make vigorous plants, which is their greateſt qualification.

HERE they muſt lay two winters and one ſummer, until the time of ſowing (the beginning of March) then they may be ſifted from the aſhes, or ſown all together, which is much the beſt way.

THE ground fit for ſowing them ſhould be light and rich; and as there are many that do not come up before the ſecond year, all that come up the firſt year ſhould be drawn in the winter; moſt of them will be fit to plant out for hedges.

THE reaſon for drawing out thoſe that

come up the firſt year is, to let thoſe that come up the next have free air and room to grow. The ſeed-beds ſhould not be deſtroyed for three or four years, for if the large ones are drawn, thoſe that come up laſt may ſtand in the beds until they are fit for uſe.

EVERY time there are any drawn out of the ſeed-bed, it will be neceſſary to dig the alleys, and lay a little earth all over the beds, becauſe in the drawing there will be many of the ſeeds raiſed out of the ground.

IF quicks are wanted in a hurry, they may be made to come up the firſt year; that is, *many of them*, which will be fit for uſe next winter.

AS ſoon as the deſigned quantity of haws are gathered, mix them well with twice as much freſh grains from the brewhouſe, (old grains will not anſwer) and lay them up in a round heap, covering them all round with half an inch of grains.

THERE they may remain for ten or twelve days, by which time they will be in a gentle heat; they muſt then be turned and laid up as before, and lie as long, by which time moſt of the pulp will be rotted off; then they ſhould have another turning, and a good deal of ſand mixed with them, and rubbed between the hands, and laid up cloſe, and covered two inches thick with ſand to keep them from froſt. They muſt be under cover; an open ſhed will do. Theſe muſt be ſown in March.

IF there is a hedge to plant in poor gravel or ſandy ſoil, pare off the graſs as thin as poſſible two feet wide; take out a ſpade of earth and put in a quick, which ſhould be cut eight inches long, and laid in ſloping, ſo that the top ſhould not be above two inches out of the ground; then dig on a foot and lay another in the ſame manner, and ſo on to the end; then there will be a ſtraight row at a foot diſtance.

OPEN

OPEN the ground two inches diſtant from the firſt row, and plant another quick in the ſame manner between every one of thoſe firſt planted, ſo that there will be another ſtraight row two inches wide of the firſt, and the quicks at ſix inches diſtance.

LET it grow at pleaſure for two years, by which time the ſhoots will be a good length; ſo that they may be platted into one another, and then with a pair of garden ſheers cut off all the long ſtraggling branches. There is nothing further requiſite for two years; then it ſhould be platted, and cut as before.

IF the hedge is to grow tall, provide a hedge-bill with a long handle, and in winter ſwitch off all the long ſide-branches that over-hang the bottom of the hedge, and keep the top narrow, and it will be a good and neat fence for many years.

IN ſuch grounds there is no occaſion for

for ditches, ſo there will be no ſcouring, and the dreſſing will be a very ſmall expence, as a man will ſwitch and dreſs as much in a day as he could ſcour in a week. Scouring in ſuch dry ground never ſtands well.

In all poor gravel and ſandy land, if a little very rotten dung can be ſpared to put to the root of each quick, it would be of great ſervice, and would encourage their growth greatly. If the hedge is to be kept clipt, which is the beſt way to have a good fence on ſuch poor land (for they grow very ſlow after laying) it ſhould be clipped every year after the ſecond platting. The expence of clipping will be leſs than where ſcouring is wanted, and it may be performed in winter, when little other buſineſs can be done in the fields.

If the ground is ſtrong clay there will be water to carry off, ſo there muſt be a ditch. The beſt method to have a good

hedge

hedge is to make the ditch and throw the beſt of the earth up behind, and ſo form a border, and plant the hedge in the border a foot from the face of the ditch, in the ſame manner as that planted on poor land.

THE ſlope of the ditch on that ſide the quick is planted, ſhould be faced with the turf that is cut off the top of the ditch. The turf ſhould be a ſpade deep, and the firſt ſhould be laid as low as the bottom of the ditch (if two inches lower it would be better) to prevent the water undermining it, which it frequently does where there is a bare ſpace left below the turf, ſo that the whole tumbles down.

THE advantages of planting the quicks in this manner are many, and attended with only one inconvenience; that is, there muſt be a few thorns pricked in the top of the ſlope, to prevent the cattle ſetting their feet on it, and to hinder them from cropping the quicks and pulling down the ſlope.

If the ground is good and no water to carry off, it would make a much better fence to plant on the level ground, as on poor land; for beſides growing much better, there is no expence in cleaning and ſcouring the ditches.

It is three years longer in being a fence than if there was a ditch; but after it is fenceable, there is no further trouble than annually to ſwitch off the long branches that over-hang the hedge bottom, and makes it ſoon naked when they are not taken off.

The over-hanging of the top-branches kills all the bottoms; the hedge grows ſo thin that it is not fenceable, and then it muſt be laid; but by this annual trimming it will be very good for many years, and will grow much taller, and be a much better ſhelter, where it is wanted for that uſe.

If on good land there is water, and a ditch

ditch is neceſſary, make it the ſame as in clay land, and plant the quicks in the ſame manner; and if turf can be got it would be right to face the ſlopes on both ſides, as the light mould will tumble down with froſt and rain and fill the ditch bottom ſoon.

If the ground is wet, planting in the face of the ſlope is the beſt method; but if it is boggy, quicks will not thrive; they grow cankered and ſtunted, and never will make a fence.

In boggy grounds Willows will make a good fence with little trouble. If a ditch will carry off the wet, make one as before directed; but if it will not, there is no occaſion for any.

Provide good ſtrong truncheons of the large growing kinds, three feet long; with an iron crow make holes two feet deep and eighteen inches diſtant, and plant one into each hole, making it faſt

with the foot. This may be done in any of the winter months.

THE firſt year they will ſhoot many ſtrong ſhoots; let ſome of thoſe be platted a foot from the top of the truncheons, ſo then the fence will be two feet high; let all thoſe that are not platted in be cut off, but not too cloſe. The next year plat ſome of the ſtrongeſt ſhoots a foot higher, ſo that the hedge will then be three feet high.

NEXT year cut all the upright ſhoots a foot from the laſt platting, for there will be no occaſion for platting them any more. Thus there will be a fence four feet high which cannot be broke through. All the ſide-branches muſt be cut every year, and in a few years they will grow very thick and ſtrong, and be as good a fence as a quick hedge.

ALL hedges that are deſigned to be clipped ſhould be platted the third and fourth

fourth year after planting, as it binds them ſo that they cannot be broke through; but thoſe that are to grow high, and are afterwards to be laid, ſhould not be platted at all, for they would be ſo intangled that it would be impoſſible to ſeparate them.

THOSE on gravelly poor land make but bad fences when laid, ſo that the beſt way is to clip them; but if that is thought too great an expence to the farmers, if they will carefully keep them thin at top, and cut off all the ſide-branches that over-hang, they will laſt at leaſt twenty years and more, and be in a good condition to lay after that time.

IN good land and clay grounds laid hedges will anſwer very well. The cutting the boughs that hang down will be of great ſervice to thoſe that are to run up to height, and are to be cut down and laid. By the trimming of them annually

they will remain good fences longer than can be imagined till tried.

HEDGES that are laid are in general ſpoiled in the bottom by weeds and graſs the firſt and ſecond year after laying, becauſe there are many root-weeds and graſs in the bottom of old hedges which have great roots, but have been prevented from growing in ſummer by being ſmothered by the hedges hanging over them; but when it is cut cloſe they grow very faſt, and almoſt or quite cover the whole hedge, which is of great detriment to the young ſhoots.

THE beſt method to manage them is to lay the hedge firſt, then with a ſtubbing-hoe clean all the ground on both ſides, taking up all the roots of briars, which run great lengths and do a deal of hurt; alſo all root-weeds and ſtrong benty graſs; then face up the ſlope with turf from the ditch, always obſerving to let the firſt ſpade of turf be laid even with the bottom

tom of the ditch, and never to plaiſter the mould up to a point againſt the quicks, but lay it in between and at leaſt a foot beyond the hedge. There ſhould be eight or ten inches flat between the ſlope and the hedge, which ſhould be kept as clean for two years as if it were a new-planted one, and by that time the hedge will be even with the face of the ſlope, and prevent weeds growing to hurt it.

In five or ſix years, if the ditch ſhould want cleaning and facing, give the turf that it is faced with a moderate ſlope; but by no means carry it nearer the hedge than it was at firſt.

Let the mould be broke down amongſt the roots of the hedge, and laid flat at top; this encourages its growth greatly; but when the mould is laid up to a point againſt the hedge, it deprives it of all moiſture; and when one ſide is covered up a foot, the other is quite bare. By being laid up in that way it is very

liable to ſlide down, and is often much damaged by heavy ſhowers.

It is frequently diſputed whether live or dead ſtakes are beſt in a laid hedge. I am of opinion dead ſtakes are beſt, for this reaſon, that the live ſtakes ſhoot much ſtronger and faſter than the branches that are laid, and grow quite upright.

In a few years they over-hang the winders and kill them; and although they meet at top there are great gaps in the bottom. It will be of ſervice, where there is any, to cut them cloſe down to the binding of the hedge for two years, as it will encourage the growth of the winders, ſo that the whole will be much cloſer.

If live ſtakes could be left regular at two or three feet diſtance, a good hedge might be made with a very little trouble. The winders ſhould be laid in very thin, and all the ſhoots that grow upright on the

the top of the ſtakes ſhould be rubbed off at leaſt four times in a ſummer. This will cauſe the ſtakes to puſh many ſtrong ſide-ſhoots, which all grow almoſt horizontally, and will ſoon meet.

To rub off the top-ſhoots of the live ſtakes would be a trifling expence; a man might go over a large farm in a day, if all the hedges were laid in one year, which never happens.

If hedges were managed as here directed, the expence would not be ſo much as it is in the common way, becauſe they would laſt much longer, and be much better fences.

It is the common practice to plant trees in hedges, and is recommended as beneficial; but it is an exceeding bad practice, and ſpoils the hedges, for they grow to ſhort boles and large heads; ſo far as the branches hang the fence is very weak, and the trees are never of great value.

It deſtroys and waſtes much ground, as little will grow under the drop of their branches, and the roots run a great way into the fields when in graſs, which are very troubleſome when taken into tillage.

The beſt method is to plant a few trees in the corners of the fields, and where hedges meet. If all the four corners are planted, it will make a handſome clump; and, as the trees may be planted thick, they will grow ſtraight and tall, and make fine timber, which they never will do in hedge-rows.

If the fields are large, the clump in each corner may be made ſo that when grown up it will be fine ſhelter for cattle in winter; and the fields may be kept ſeparate by a coarſe rail.

Trees thus planted will be more beautiful to the country, leſs damage to the farmers, and more profit to the landlords.

As they will be of courſe very irregular, from any eminence at a diſtance the whole country will look like an entire wood, beautiful ſurpaſſing imagination.

THERE is another improvement that would render the face of the country beautiful and ſweet, viz. to plant red and white roſes in all hedges. Honey-ſuckles are often planted, and are very ſweet and pretty; but they are ſuch great runners, and grow ſo thick, that they deſtroy all the quicks, therefore I would not recommend them: ſweet-briar will be full as fragrant, and be no detriment to the hedge. The common wood-roſe is pretty in hedges; but it grows ſo vigorouſly that it is hurtful to the quicks. The red and white ſpindle-tree might be planted in hedges that are to grow high; their berries are beautiful in winter: and if ſome hollies were ſcattered at a diſtance they would look cheerful.

IT is a common practice (and as hedges

are managed there is no avoiding it) when a hedge grows thin in the bottom, to draw cut thorns into it to ſtop the gap; but in reality it makes it larger, for the cut thorns are drawn in very thick to ſerve the preſent purpoſe, which kills the live wood, and in a few years the whole bottom of the hedge is ſtuck with dead thorns, when the top is thick, ſtrong, and vigorous.

The cutting up of the ſide-boughs that hang down annually prevents all this; but if by any accident there ſhould be an open in the bottom of an hedge, ſtick in a few ſmall ſtakes and wind ſome live branches to them, and it will be cloſe in a year's time, as the ſtakes will make the gap good in the mean time, and be no detriment to the hedge.

CHAP.

CHAP. X.

On Vines.

THE cultivation of vines, and the bringing the fruit to maturity, has been much ſtudied of late, and not without ſucceſs; but, from a long and aſſiduous application, I have diſcovered many things that are not in common practice, which I hope may be of ſervice to the public.

I SHALL begin with raiſing of the plants, and go through the management of them; firſt, on common walls (for the benefit of thoſe who reſide in countries where they will ripen without help) ſecondly, on fire-walls without glaſs or covering, thirdly, on fire-walls with glaſs or ſome other covering; in glaſs-houſes or ſtoves built on purpoſe for them,

them, called vineries, and in ſtoves that are uſed for pines.

I SHALL alſo recommend a method to prepare the borders for planting them, very different from what is in common practice, together with a particular method of obtaining good plants that will be very fruitful. I begin with the chooſing of them, which is cuttings, they being much better than rooted plants, and, if managed as directed, will bear fruit ſooner and much better.

THE method of procuring good vine cuttings has not been attended to with that attention which is requiſite, as the chief part of the ſucceſs depends on their being good. Theſe ſhould be taken from plants near the bottom of the wall, good bearing plants that have their eyes round and plump, their joints ſhort, and the wood quite round.

CUTTINGS with theſe properties will be very

very fruitful, whereas cuttings from the upper parts of the wall, although they may ſeem to have moſt of the properties of thoſe cut from the bottom, are far inferior, being in general longer jointed, the wood ſofter, and more apt to ſhoot into great rambling wood.

When they are taken off, there ſhould be an inch of the old wood to each, which ſhould be cut ſloping. Three eyes are a ſufficient length; the top ſhould alſo be cut ſloping from the eye, and a quarter of an inch above it.

Being thus prepared, put them into light dry ground (not too near together) up to the laſt eye, preſſing the ground cloſe to them; and before the froſts come on, cover them over four inches thick with dried fern, or dried peaſe-ſtraw, and let them remain until you want them in ſpring: they muſt not be touched with the knife then, for it will cauſe them to bleed, and ſpoil them entirely.

Some

SOME may think that all this precaution is not neceſſary, and that a cutting taken from any part of the wall, if it has the properties (as to outward appearance) of thoſe taken from the bottom, is equally good; but let thoſe who think ſo only try the experiment, and they will find their error; the bottom cutting will ſhoot leſs vigorous wood, but be much more fruitful.

CUTTINGS are much the beſt for making all kinds of vine plantations. It is objected they are longer in bearing than young plants, which I never found to be the caſe; for if young plants are brought from any diſtance, it will be neceſſary to cut off all the ſmall fibres, which will ſo far impede their growth, that the ſhoots from the cuttings will be ſtronger, and bear fruit ſooner and much better.

WHERE there is an old plantation of vines, and a ſtrong plant is wanted for any particular place, if it is taken up carefully with

with a good ball, and planted immediately, it will anſwer very well; but this is only moving from one part of the garden to another a few plants; and if the vine be very old, it is difficult to be done with ſucceſs.

THE common method of planting vines (or cutting of vines, for there have been ſome walls planted with cuttings) is to plant them at ſeven or eight feet diſtance, and ſo train the ſide-branches to fill the wall; but there is a better way to have finer grapes, and to have them bear ſooner.

PREPARE ſome good hot dung as for a melon bed; make it up in the ſame form, but two feet wider than the frame that is to cover it; two feet high will be ſufficient, but it ſhould be well trodden to prevent the heat being too ſtrong at firſt. Stake it all round the ſides with ſtakes two feet long, and wind them with ſtraw ropes very cloſe to the top.

PROCURE ſome freſh tanner's bark from the tan-pits (if the bed is to be covered with a three-light melon frame, which will hold eighty plants) two good loads of bark will be ſufficient, and ſo in proportion. If the bark can be made dry before it is laid on the bed, it will be better; but as the weather is generally very uncertain at that time of the year (February) it may be dried in the bed.

LAY it on a ridge in the middle of the bed; ſet on the frame and glaſſes, and give it air: as the bark dries, draw it to the back and fore-ſide of the frame till the whole is dried; then take off the frame, and ſpread it all over the bed; ſet on the frame and glaſſes; let them lay cloſe until the heat is riſen, which will be in three or four days, when it will be of a moderate temperature, if all has been performed as directed.

PREPARE ſome mould a little lighter and richer than is generally uſed for melons.

lons. Take penny garden-pots, and into each put one of the cuttings, but be ſure there be an inch of mould between the bottom of the pot and the lower end of the cutting.

THERE ſhould be only one eye left out of the mould, and the top of the cutting ſhould be ſloping to one ſide of the pot. When planted, plunge them into the tan half the depth of the pot at firſt (for they require little heat for ſome time) put on the glaſſes, and give them air night and day as long as there is any ſteam in the bed.

GIVE them no water while the ſteam is ſtrong in the bed, for although they have air, they will be all wet with it in the night. It will be proper to ſhade them in the day if it is very hot.

WHEN the buds begin to puſh (by which time the ſteam will be gone) give them a little water at the bottom when the

the mould appears dry; but care muſt be taken to give it ſparingly, and often, for too much at a time would rot them. It will be of great ſervice to them to ſprinkle them all over twice a-week in the evening, and ſhut the glaſſes cloſe; but they muſt have air in the morning early to dry the wet before the ſun becomes hot, for if they are wet it will ſcorch the end of the bud, and prevent its growing. They will require little water for the firſt three weeks.

When the heat begins to decline, which will be in about five weeks (for the bark will grow mouldy, and then it loſes its heat) take all the pots out, and ſtir the bark down to the dung; level it, and plunge the pots up to the top; put on the glaſſes, and give a little air; for although there will be neither heat nor ſteam for three or four days, there will be a rancid ſmell, which will be very prejudicial to the plants, and turn them yellow.

When the heat riſes, if it is moderate, which it generally is, there will be no further trouble with it, for it will laſt long enough to bring the plants to perfection: but if it ſhould be very hot, which ſometimes happens, the pots muſt be raiſed until the violent heat is over, and then they may be let down, only ſtirring the bark deep enough to plunge them to the top. They will now require a good deal of water and air, if the weather is warm.

If they puſh more ſhoots than one, take them off as ſoon as they appear; put a ſtick to that which is to remain, and tie it up as it advances in height, for it will be of great detriment to the plant, and retard its growth, to let it lie down.

The frame ſhould be raiſed as the plants grow high, ſo as to keep the glaſſes a foot from the top of the plants; but the bottom of the frame ſhould be kept cloſe, ſo as no air can get in (which will be eaſy to do, as the bed is broader than the frame)

by ſticking a few ſtakes round, and ſtuffing ſtraw between the vacancies.

As the plants advance in height they will puſh out ſide-branches at the eyes, which muſt be conſtantly picked off as they grow; but not in the common method, which is to break them off cloſe to the eye: they muſt be pinched off a joint above the eye, and then they will puſh again at that place, and never hurt the bud that is to remain for next year's ſhoot.

When they are taken off cloſe to the bud, it often puſhes, and that joint is loſt, which, if near the bottom, is of bad conſequence; and although it does not puſh, there often comes one, ſometimes two ſide-branches juſt by the eye, which weakens it greatly, and renders the place very unſightly.

This ſhould be obſerved in taking off the ſide-ſhoots of vines of all ages, that they puſh again much ſooner when they

they are pinched off at a joint than when they are taken off close, and will require a little more labour to keep them clean; but by this method the eyes are all saved; and as they push much weaker when they are pinched off at a joint than when they are taken off close, the vine buds for next year are much stronger, and consequently the fitter for bearing good fruit.

THE bed for the vines should be made the beginning of February; and, if all succeeds well, they will be fine strong plants four and five feet high the beginning of June, at which time we should begin to harden them; first by taking off the glasses morning and evening, and giving them air all night; for if great care is not taken, they will be stopped in their growth and turn red, which will be of bad consequence, as then they will not strike root after planting.

THERE is no other difficulty in keeping them growing, than being cautious, giv-

ing them air gradually, and not expoſing them to the ſun above an hour in the morning.

TAKE off the glaſſes at five o'clock at night, let them ſtand ſo till ten o'clock, and after they have been uſed to that management for ten days, they may ſtand uncovered all night, and have a great deal of air in the day-time. If a dull ſoft day happens they may be uncovered all day.

WHEN they are ſo hardened that they can ſtand the ſun, they are then ready for planting, which will be about the beginning of July, and they will have time to ſtrike root in the common borders before winter, and will be very fine ſtrong plants.

THE common method of preparing borders for vines is to mix lime rubbiſh and hard ſtuff with good earth, which I have found, by many years experience, to be wrong, and not a fit compoſition for them. Borders in general for all kinds of fruit-

seeds are made too deep; two feet is quite sufficient; the breadth ten feet at least. When borders are made deep it encourages the roots downwards, where neither sun nor air can have any influence, and of consequence the fruit is not so well flavoured. If they are properly prepared there is no danger from drought, which is the only thing that can hurt shallow borders.

In making of all kitchen-gardens it is a common practice to set out the borders and walks; then to empty the walks of all good earth, and to fill them up with all the rubbish and stones that are found in making the garden.

The roots of most trees run much further than is generally imagined, especially vines; and when they meet with that bad stuff it cankers them, and infects the whole tree. This is a good reason why espaliers, and other fruit-trees planted round kitchen-gardens, so often decay; for the

borders are ſeldom above ſix feet broad, and if they are planted in the middle they have only three feet to run on the ſide next to the walk before they reach this rubbiſh, which cankers their roots and infects the whole tree.

To make a good kitchen-garden, and to give all the trees an equal chance, would be to take levels of the whole; and, if it can be conveniently done, it ſhould ſlope all to the ſouth; but if the ground will not admit of that, and ſome part falls to the north, there ſhould be a large covered drain where the falls meet.

If the bottom is clay, it will be much better to raiſe the level than dig into the clay. None will attempt to make a kitchen-garden in a ſpot where there is not at leaſt eight or ten inches of tolerable good mould.

It would be much better for all the kinds of trees and herbage that are to grow

in it, to let the clay, gravel, ſtone, or ſand remain, and bring earth to make the ground of a ſufficient depth, as it will be leſs expenſive; and there is no neceſſity that the eaſt and weſt walls ſhould be level at the top, nor that they ſhould fall regularly to the bottom; for if the garden is higheſt in the middle, and falls to the right and left, it will be no offence to the eye, nor detriment to the ground, provided there be a fall to the ſouth.

If any little heights intervene they ſhould be taken down, ſo as to make the bottom of the ground have the ſame level with the top; for that is of more conſequence than is generally imagined. If the bottom be clay, and there is a hollow dug, it holds water; and when the roots of trees reach the place, they are rotted.

A HEIGHT has the ſame effect, as it ſtops the water, throws it back, and makes the ground all round very wet.

Hills of ſtone or ſand are alſo of bad conſequence, for the roots are either ſtopped by them, or they run into them, which is much worſe. If the bottom has no obſtructions the water paſſes off regularly, and the roots of trees and plants meet with no impediment under ground, ſo that all things will thrive well.

When the levels are fixed upon, the walks ſhould be ſtaked out and dug over, and cleared of all weeds, ſtones, and roots, as deep as the bottom of the other parts of the garden, and left ſix inches lower than the level, which will be ſufficient to lay gravel, or any other kind of hard ſtuff, to form the walks, for graſs walks are very unfit in kitchen-gardens.

But if any gentleman prefers them to gravel, they ſhould be left only two inches lower than the kitchen ground and borders, which ſhould be filled up with ſharp ſand to lay the turf upon, as it will make them much drier for walking on in winter,

will

will greatly prevent the worms from working in them, and keep them from growing too flush in summer, which they would do, as the ground is all made good below. They should also be made a little round to make the wet run off.

If the kitchen-garden is a small one, the walks should be narrow in proportion; in that case the whole ground may be trenched, and the walks emptied either for grass or gravel, as the owner chooses, and the soil that is taken out of the walks may be scattered over the kitchen ground.

If the walks are thus formed and made good, the borders may be contracted to what breadth the owner pleases, and it would be no detriment to the trees on the walls, if the gravel was laid close to the wall.

But it would be so far a loss, that there would be no south borders for planting things to stand the winter; and every

five

five or six years it would be necessary to take up the gravel to add some fresh composition for the encouragement of the trees, which should be prepared some time before it is used. By this management the trees will thrive very well, and the garden will be exceeding neat.

If the gravel is laid close to the wall, or the borders contracted, there should be at least ten feet distance from the wall, made as good, and in the same manner, as if the borders were of that breadth, which is sufficient for the roots, provided they meet with no obstruction after they have run that length.

This digression is for the advantage of those who are making new kitchen-gardens, as it will be of great service to espaliers and dwarf-apple-trees on the sides of the walks, and of great use to the wall trees; for although the borders are twelve feet broad, which is wider than can be

afforded in a ſmall kitchen-garden, beſides it is in no proportion, and very unſeemly to ſee a ſhort narrow walk and ſo broad a border; and if the trees are ſo planted that the roots be made to run horizontally, they in a few years will reach the ſide of the walks, and then the roots are liable to all the misfortunes that they would have been, had the border been narrower; only then it would have happened ſooner, which any one may ſee that will be at the trouble to examine into the bottom of a rubbiſhy gravel walk, although the border was fourteen feet broad.

If ever there have been thriving trees on the wall, the roots will be found cankered and full of knobs and bunches. I do not pretend to ſay it is from that reaſon that trees do not thrive; they are liable to many other misfortunes, and often decay before their roots extend half way over the border: but it is my opinion that moſt of the thriving trees off ſix and ſeven years old, that go of by canker, are infected from that cauſe.

I AM confident that thoſe who pleaſe to try this method of making their kitchen-gardens, will find their trees flouriſh much better than by any method that has hitherto been practiſed; and the wideneſs of the borders, which has been introduced of late years, is a certain reaſon that what is here directed will be of greater ſervice. But to return to the making the borders for Vines.

IF the natural ſoil is a light ſandy loam (which is the beſt) with a clay bottom, raiſe the ground ſo as to have a ſufficient depth (two feet) which is much better than digging down into the clay, although it ſhould be neceſſary to have a ſtep or two into the garden.

SPREAD ſix inches of rotten dung all over the top of the border; open a trench two feet deep; lay three inches of the dung in the bottom; and when the border is a foot high, lay in the other three inches, and then fill up the border to its level;

level; leave the laſt trench open, and in about three weeks work it back again; only when within four inches of the dung that is lain in the bottom, it ſhould be dug over, and the dung and the ſoil well mixed. The dung that is laid in the middle will mix in the courſe of working, but none of it ſhould be brought to the top. This laſt trenching ſhould be at leaſt ſix weeks before the border is planted, in order that the ground may be well ſettled.

HALF a year at leaſt before planting make up the following compoſition, the quantity according to the number of vines that are to be planted: Two loads of good freſh loam from a paſture, two loads of rotten wood that is become earth, one load of ſharp ſand, and one load of very rotten dung; lay it in a long ridge four feet broad at bottom, and quite narrow at top: this muſt be turned often, until it is ſo well mixed that none of the ingredients can be diſtinguiſhed. If this

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was made up in the beginning of winter, and turned over when hard frozen (without ſnow) it would be of very great ſer-to it.

THE borders, compoſition, and plants being now all ready, provide flat flags or ſtrong ſlate a foot ſquare. For as many plants as the plantation conſiſts of, make holes a foot ſquare, one foot deep, and at two feet diſtance; lay the flags or ſlates into the holes, ſcatter the mould that was taken out of the holes all over the border, and lay an equal quantity of the prepared compoſt down at every hole; put into the hole, upon the flag, ſo much of the compoſition as that, when the plant is put into it, the ball may be covered an inch.

TAKE the plant carefully out of the pot, looſening the roots gently; but great care muſt be taken not to break them; then place them in the hole eight inches from the wall, their heads inclining to it; fill up the whole with the compoſition all round

round the ball, as high as the top, preſſing it gently with the hand, and ſo proceed until the whole is planted; then give them a good watering, and a little after cover the ball an inch over the top with the compoſition; faſten the plant to the wall with two or three nails, according to its length; ſpread an inch of rotten dung all over the border, and prick it in four inches deep.

If all has been managed as directed they will grow a good deal after being planted, therefore muſt be faſtened to the wall, and have the ſide-ſhoots picked off as they advance in height and puſh out; but as the lower part of the vine will have given over puſhing ſide-ſhoots, thoſe now at the top may be broke cloſe off, as all that part will be cut off in pruning, but is now allowed to grow to ſtrengthen the lower part of the vine, which grows much ſtronger than if they were ſtopped at the top; for when they are, they puſh many vigorous ſide-ſhoots.

The uſe of the flag is to turn the roots horizontally at their firſt growing; and as the plants have been raiſed in pots, the roots are prevented from taking a downright poſition; and although the bottom of the border is hard clay, there will be no occaſion for any rubbiſh or ſtones being laid in it, for the roots will run horizontally, and never attempt going into the clay.

If cuttings are taken off and preſerved, as before directed, during the winter, and planted, as above, againſt either common or hot walls, they will anſwer very well. They ſhould be planted in the beginning of March; they will do much better than thoſe that are raiſed in a ſeparate place, and taken up and planted againſt the walls afterwards; but they will be two years longer in bearing fruit than thoſe that are raiſed and trained in heat, and will not be ſo ſtrong the third year as thoſe raiſed in heat will be the firſt. Vines are much better never to be removed.

About

About the beginning of Auguſt nip off the end of the leading ſhoot; for if it is done ſooner they will puſh out ſo many ſide-branches, that it will weaken the plants greatly, and they will ceaſe growing.

As ſoon as the leaves grow red, which will be about the end of September, prune them, and moſt of them will be ſtrong; cut them, according to their ſtrength, into one, two, or three eyes; let the ſlope of the cut be oppoſite to the eye, and a quarter of an inch above it; and as you cut them have ſome clay at hand (a little ſofter than for graffing) and over every cut give a very thin cover; this will be of great ſervice to them; for the wood of young Vines is ſoft and ſpongy, and their hearts opener than thoſe that are come to maturity.

The thin coat of clay prevents wet and froſt from penetrating them; and being cut a little above the eye, although

the froſt be ſevere, it never damages the bud, which often happens when cut cloſe to it.

If the plants raiſed in pots are planted againſt a flued wall (for they will do very well on common walls, in countries where they ripen without aſſiſtance) it will be of great ſervice to add a little fire to them for two months after they are planted, as it would encourage their growth greatly, and ripen the wood much better.

The border which has been prepared and planted is ſuppoſed to be a ſandy loam, which is certainly the beſt; but as that cannot always be had, it will be neceſſary to give ſome directions for preparing all the different ſoils which can happen, at leaſt thoſe that are fit to plant Vines in.

If it is a ſtrong loam, which always has a hard clay bottom, but in general a good depth of ſoil, a compoſition of light black

black earth, ſharp ſand, and coal or wood aſhes (if coal aſhes, they muſt be ſifted through a fine riddle, as any pieces of coal would canker) and it will make the border in good order.

If the ground is in graſs, and a ſtrong loam, open a trench two feet deep, pare off the graſs two inches thick, and lay it in the bottom of the open trench; then two inches of rotten dung; then ſix inches of the natural earth, two inches of the compoſition, four inches of natural earth, two inches of dung, two inches of natural earth, and four inches of the compoſition; let all be well mixed (only the turf at the bottom ſhould not be diſturbed) to incorporate the different ſtrata, and they will then be fit for planting.

If the ground is ſandy, or a light black earth (the ſame materials will anſwer for both) a good quantity of a ſtrong loam and rotten dung, the dung and loam equal to

a third of the natural ſoil, and well mixed, will make it in good order for planting.

A HARD dry gravel is thought the propereſt ſoil for Vines of any, and not without good reaſon, as moſt of the fineſt wines are produced from ſuch grounds; and I have been informed that the fineſt of the Spaniſh wines are produced from the grapes that grow wild on the rocks without any cultivation; and from thoſe obſervations it was recommended to mix lime rubbiſh and gravel with the ſoil on borders that are intended for Vines, and the directions ſeem very rational; but experience and the obſervations of many years have made it plainly appear to me to be a wrong practice.

THE grapes in thoſe countries are ſmall, and the great heat brings them to perfection; but even there thoſe ſorts are not eſteemed for eating: beſides, they are not allowed to grow above three or four feet high,

high, and to carry a few cluſters on each branch, which no ways anſwers clothing a wall of ten or twelve feet high from top to bottom; the wood, foliage, and fruit muſt be ſupported to bring them to perfection; and I have found, by long practice, that Vines thrive, and carry large and good-flavoured fruit, when planted in borders prepared as here directed.

I HAVE tried many compoſitions, and all hard ſtuffs, ſuch as gravel, rubbiſh, &c. and they never produced ſo good-flavoured fruit. I have been informed that all the vineyards round Rome are on a fine rich deep loam, and are manured with the aſhes and the cleanings of the ſtreets, and that they produce the beſt of eating grapes. It was from this hint I firſt began to alter the preparation of the borders for Vines, which has been crowned with many years ſucceſs.

IF the ground is a hard gravel, add four loads of rotten dung to ſixteen loads of

good ſtrong loam and eight loads of the natural ſoil; mix them well, and after the border has been worked all over in that manner it will be fit for planting.

In all the different ſoils that have been treated of, the ſame manner of planting muſt be obſerved that is directed in the firſt; for the goodneſs of all fruit depends greatly on having the roots run horizontally and ſhallow, and none more than Vines.

If the cuttings raiſed in heat are deſigned for a hot-houſe adapted for Vines, or a ſtove that is employed for Pines, the beſt way would be to plant them as ſoon as they are fit, for it is impoſſible to harden any thing that is brought up under glaſſes, ſo as to make it endure the open air without giving it a check; and as they are both covered with glaſſes, the plants will ſuffer nothing by being planted as ſoon as they are ready.

THOSE in the hot-houſe that are for Pines will thrive and grow beyond what many will imagine; and thoſe that are planted where there are no Pines, if they are managed in the ſame manner, will anſwer beyond the moſt ſanguine expectation. The preparation of the ground for them ſhall be treated of when we come to give directions for the management of Vines in in ſtoves and vineries.

GREAT care muſt be taken the next ſpring, when they begin to ſhoot, to keep all ſhoots that come from the bottom rubbed off as ſoon as they appear, and none allowed to grow but thoſe from the buds left in pruning. They ſhould be carefully kept to the wall, and all the ſide-branches nipped off, and allowed to run to the end of July; they ſhould then be ſtopped. There will be ſome little cluſters of grapes this year; but the encouragement of the Vines is the only thing to be regarded, ſo that there ſhould be moderate fires kept.

I FOUND by the experience of many years that moderate fires, which would bring the fruit to perfection in September, are a great advantage to young vines, as they ripen the wood, and make them fit for pruning early in autumn.

YOUNG plants that are vigorous grow much longer than old ones, and when they have no aſſiſtance they are not fit to cut till late in the ſeaſon, which is of very bad conſequence to them; for they ſhould not be pruned at a time when there is a probability of froſt, but it ſhould not be deferred till ſpring; for although they are late in ſhooting, if they are pruned any time in March, which is as ſoon as it can be done with ſafety, and at that time they have no appearance of vegetation, yet as ſoon as they begin to puſh (and ſometimes before) they will bleed much, although every gardener knows how to ſtop their bleeding, and may prevent their receiving any damage; yet their bleeding, when cut in ſpring, ſhews evidently it is wrong,

as

as they never bleed when cut in the autumn.

If the wood is not ſufficiently ripened by the end of July (which it generally is) keep on the fires ten days longer; then let them out gradually, and they will be fit to prune in the middle of September, without danger, as the froſts ſeldom are very hard at that ſeaſon.

The Vines will now be ſtrong and vigorous, and, at this cutting, every ſixth plant may be left a yard long, and thoſe between to three, four, and five eyes, according to their ſtrength.

In order to get the wall covered with bearing wood, cut them ſloping as before directed, and nail them; then ſpread ſome very rotten dung four feet broad from the wall, and prick it in with a dung fork (a ſpade ſhould never be uſed nearer than four feet of the wall); then all is finiſhed for this ſeaſon.

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THE next ſpring, about the end of March, make on the fires, ſlow at firſt, but increaſe them gradually, ſo that when the Vines have ſhot about an inch the walls ſhould be milk-warm all over, and ſhould never be much hotter.

RUB off all branches that attempt to ſhoot from any part of the Vine, except from the eyes left in pruning; carefully nip off the ſide-branches, and keep the young ſhoots nailed as they grow.

THERE will this year be a tolerably good crop of grapes; and as ſoon as they can be diſtinguiſhed, mark the wood for next year, which ſhould be the ſhoot next the old wood; and when thoſe that have fruit, and are not for next year's wood, are grown two or three joints beyond the fruit, top them; but thoſe that are deſigned for the next year's wood, although they have fruit, muſt not be ſtopped before the latter end of July, which will cauſe them to grow ſtrong and vigorous for next year's crop.

THE fruit on them will be ſmaller and later than thoſe that were ſtopped, but they will come to ſucceed the others, and it will be a great advantage to the wood.

WHEN the fruit is out of bloſſom, and as large as a pin's head, if the weather is dry and warm, they ſhould be watered twice a week; but if there be ſhowers, once a week will be ſufficient, until the fruit is come to its ſize, after which it ſhould have no more water at bottom; but if the weather is very dry, and there is little dew, if the whole wall was ſprinkled in the evening, once a week, it would increaſe the ſize of the fruit.

THERE is nothing further requiſite until pruning time, but to keep them clean of all ſhoots that attempt to ſhoot from the old wood and the ſide-branches, which muſt never be neglected.

IT would be of great advantage to both fruit

fruit and Vines, at the beginning of the year to lay ſome ſhort graſs cloſe to the wall, four feet broad and two inches thick. This will keep them moiſt after watering, and prevent the ground from cracking, which frequent watering occaſions; for if it cracks, the roots of the Vines being near the ſurface of the ground, it would deſtroy all the ſmall fibrous roots, and greatly damage the fruit, and retard their growth.

When the grapes are all ſhewn, and the next year's wood fixed on, if there are any ſhoots that have no fruit, pull them off. If they come clean off (as they ſhould) they will leave a ſmall hole in the old wood, which ſhould be immediately filled up with worked clay; for very ſoon after the ſhoot is pulled off it begins to bleed, after which it will be difficult to get the clay to ſtick; if it bleeds, it will hurt all the fruit on that branch, and greatly weaken the Vine.

By

By this method there will be no uſeleſs wood on the wall to weaken the tree, nor to croud the branches that bear fruit, or thoſe that are for next year's wood, which is often the caſe.

Every pruning ſeaſon ſome of thoſe that have long bare wood may be cut down; ſo that by cutting ſome down every pruning, the bottom of the wall may be kept as well covered with ſtrong wood as any part of it. A great quantity of good cuttings cannot be had from a well-managed wall; but when many plants are wanted, if the ſide-branches of thoſe that bear fruit are nipped off at a joint, as directed for the wood of next year, there may be a good many got.

The fruit being all gathered, and the pruning ſeaſon come, the loweſt ſhoot on the plant of all thoſe Vines that were left ſix feet long laſt pruning ſhould be cut to four eyes long, to keep the bottom of the wall in good bearing wood; and the top

ſhoot of the ſame plant to five or ſix eyes, to fill the middle of the wall with young wood; and all the ſhoots between the top and bottom ſhoot cut off cloſe to the laſt year's wood. There ſhould alſo, at this pruning, be ſome more ſhoots, ſix feet long, laid in exactly in the middle between thoſe before left.

ALL the other branches ſhould be cut to five and ſix eyes, according to their ſtrength; obſerving that a weak ſhoot ſhould never be left with more than three eyes.

As ſoon as the Vines are pruned, let them be nailed, the border cleaned, and the ground forked out four feet broad from the wall; the other part of the border dunged two inches thick with very rotten dung that has been turned ſeveral times, and is very mellow: this ſhould be dug in with the ſpade.

WHEN the Vines begin to ſhoot next

ſpring, great care muſt be taken to rub off all ſhoots ſpringing from the old wood; for thoſe ſhoots that are laid in long, and had the branches cut cloſe to the old wood, will puſh out many ſhoots at every amputation, and many will alſo ſpring from other places on the old wood, which muſt never be ſuffered to grow.

THE keeping clean, and pinching off the ſide-branches, is every year the ſame, ſo need no more to be repeated.

ON the proper diſpoſition of the wood at this ſeaſon depends the beauty and regularity of next year; ſo that great attention ſhould be had to the following directions.

THERE being now on the wall two ſorts of long ſhoots, one two years old, which has a young ſhoot of five eyes at bottom, and another much of the ſame length at top, the eye next the old wood ſhould be marked for next year's wood on the low

ſhoot,

ſhoot, to ſupply the bottom of the wall; and the fifth or laſt eye on the top ſhoot, to furniſh the top of the wall.

THE laſt laid in ſhoot, which is all young wood, muſt have the loweſt and higheſt eyes encouraged for next year; and all the other plants on the wall ſhould have the eye next the old wood trained for next ſeaſon.

THERE will be ſome ſhoots that have no fruit on them; if they are not marked for next year's wood, they ſhould be pulled off to give air to the fruit and wood: there will be a hole in the old Vine where the ſhoot came out, which muſt inſtantly be filled with well-worked clay; for if not ſtopped it will ſoon begin to bleed, after which it will be difficult to make the clay ſtick. If it be allowed to bleed it weakens the Vine and ſpoils the fruit.

ALL the branches that have fruit, and are

are not for next year's wood, ſhould be ſtopped as ſoon as they have run two eyes beyond the laſt cluſter; thoſe for wood ſhould not be ſtopped before the end of July.

The next pruning the wall will be full of good bearing wood, ſo that it ſhould be left regular, and the ſhoots cut to four, five, and ſix eyes, according to their ſtrength. There ſhould this ſeaſon be ſome rotten dung ſpread four feet broad from the wall, and forked as before directed.

If Vines are thriving, and carry great crops of fruit, they will only require dung every other year after the fourth; but it will be better to dung one year half the breadth of the border next the Vines; then miſs a year, and dung the other half.

There is now only one difficulty remaining in the management of Vines on walls, and that is to keep the bottom of

the wall full of good bearing wood, which it is impoſſible to do if the Vines are planted at a great diſtance.

THERE was a neceſſity to run ſome ſhoots a great length, to furniſh the top of the wall until the other wood mounted gradually, which it is now ſuppoſed to have done.

THOSE branches that were laid in ſix feet long, and at ſix feet diſtance, having one ſhoot at bottom and another at top ſaved for wood, and of conſequence the middle being now all bare, cut them down to the ground; thoſe cut down will puſh out many ſhoots from the bottom, which muſt be all pulled up but one of the ſtrongeſt on each plant, and it will be a fine ſtrong ſhoot for next year.

THE next pruning ſeaſon there ſhould be ſome more of the long ſhoots cut down, and managed in the ſame way as in the others; and every year there will be ſome

old

old plants that may be cut down, ſo that the wall may be kept in good bearing wood at the bottom for many years. There is no difficulty in keeping the middle and top of the wall in young wood.

THERE cannot be many good cuttings obtained from a Vine-wall that is properly managed; but if plants are wanted, pinch off the ſide-branches in the ſame manner from the fruit-bearing branches as they are from the branches that are deſigned for next year's wood, and there will be more good plants; but unleſs the plants are wanted, the beſt way is to break off the ſide-ſhoots cloſe to the eyes of thoſe that are not for wood: they do not ſhoot ſo ſoon as when pinched off at a joint above the eye, ſo require leſs labour.

IT may be thought that more dung is recommended than neceſſary, and that it will ſpoil the flavour of the fruit; but if rightly conſidered, there muſt certainly be a great ſupply to ſupport plants on a wall

twelve feet high, covered with luxuriant branches, fruit, and ſuch great quantities of leaves as there are on a well-managed Vine-wall.

WHERE this is not obſerved, the wood is very ſmall, the cluſters little, and the ſkin of the fruit very tough, and of a very bad flavour; but where they are properly ſupplied with rotten dung that has been prepared at leaſt a twelvemonth, they will continue many years in the greateſt vigour. By this management I forced one wall twenty years, and had always good crops of well-flavoured fruit, large cluſters, and the Vines in good order.

BY the common method of planting Vines at a great diſtance, and training the ſide-branches until they meet, in a few years the bottom of the wall becomes bare, without a poſſibility of preventing it; but by planting at two feet diſtance there is a command of bottom-wood (if managed as directed) for many years.

THIS

THIS method of planting, training, and pruning of Vines will anſwer very well on common walls in the ſouth, where they ripen without fire.

THE management of Vines on a fire-wall with glaſſes, as to preparing the borders, planting, dreſſing, and pruning, is the ſame as before directed for walls without glaſſes.

THE management of the glaſſes is the thing now to be conſidered. They ſhould be made to take away at pleaſure, and never ſhould be uſed until the Vines are of a good ſtrength, which will be the fourth year, if planted in the common method; but if from cuttings raiſed in heat, they will be fit the ſecond year, if managed as follows.

AS ſoon as the plants are fit for planting, without being hardened, plant them on the fire-wall; put on the glaſſes and a gentle fire; if they have ſucceeded well

in the raiſing they will be fit to plant the beginning of June. Give them moderate heat and air, ſo as not to draw them, and they will be fine ſtrong plants by the end of Auguſt, when the fires ſhould be put out, and more air given to harden them.

If they have all thriven they will be very ſtrong. As ſoon as the wood is well hardened they ſhould be pruned, which may be done about the end of September.

They muſt be cut very different from any thing yet mentioned. Begin at an end, cut the firſt to four eyes, the next to ten, and ſo on until all are finiſhed; nail them immediately, and dreſs the border.

The reaſon for this difference in cutting thoſe young trees is, that if they were all cut ſhort there would be little or no fruit; and if they were all cut long, there would be ſo much wood that the wall would be crouded, and not have room ſufficient to lay

lay in the wood, ſo as to have proper air, which would ſpoil the next year's crop; but by this management there will be a good deal of fruit, and the Vines remain in good order for the next year: and here it will be abſolutely neceſſary to pull off all barren branches that are not for next year's wood, as there ſhould be nothing but what is uſeful left to weaken the plants.

It will not be proper to force them early in the ſpring, as they will not then be ſtrong enough; but if the fire is put to them the beginning of April, and kept on that month before the glaſſes are uſed, it will be much better for them: when the glaſſes are put on, give moderate heat and air, and there will be a tolerably good crop of grapes, which will be ripe the latter end of July.

It will do the Vines no hurt by forcing them ſo young, provided it is done moderately; and as this year the wood will be

ripened much better and ſooner, they may be pruned early, and ſo have the heat applied ſooner in the ſpring.

THOSE who delight to have grapes very early, ſhould begin in January to apply the heat; for it is much better to begin early and work moderately, than to keep them very hot, as it does leſs damage to the Vines, and there is more certainty of a crop; but it is impoſſible to force in ſo much bad weather as generally happens in thoſe cold months, without hurting the plants; ſo that thoſe who chooſe to have them early in the ſeaſon, ſhould have two ſeparate lengths for that uſe. Thoſe which were forced early this year ſhould have no glaſſes put on them the next year, but ſhould have a moderate fire applied the beginning of April, and continued until the end of July.

IN the pruning ſeaſon, that which was forced early ſhould be cut ſhort; that is, have few eyes left on a ſhoot, in order that they

they may puſh ſtrong wood for next year, as the preparation for the next early crop is what is to be regarded this ſeaſon. Thoſe who prefer a good crop to having them very early, may force the ſame wall with glaſſes for many years with good ſucceſs.

THE beginning of March is a good ſeaſon to begin to apply the heat, if the weather will permit. It is much better to have the fire at the wall ten or fifteen days before the glaſſes are put on; but it will be dangerous to keep them long without glaſs at that ſeaſon; for after they begin to puſh, and the ſhoot is juſt coming out, if the froſt ſhould catch the top of it, all hopes of a crop are fruſtrated for the ſeaſon.

GIVE a good deal of air every day, eſpecially when the ſun is hot; for if drawn, they drop their fruit after it is formed, before they come into bloſſom. There ſhould be little or no water given until

until the fruit is out of bloſſom, and then they ſhould frequently have a little; but at firſt it ſhould be given in the morning, when there is the appearance of a fine day and little wind. As ſoon as they are watered, the glaſſes ſhould be opened a good deal to dry the ſurface of the ground before night; for when the glaſſes are ſhut, there is a great ſteam, which is very prejudicial to the young fruit, and often makes it drop off; but when half grown, it is of great ſervice, and then they ſhould be watered in the evening, and the glaſſes ſhut immediately.

When the fruit is as large as a ſmall pea they will bear more heat, and the glaſſes need not be opened ſo ſoon in the morning, and may be ſhut cloſe at night before they loſe the ſun; but in the middle of the day, if the ſun is hot, they ſhould have a conſiderable quantity of air. In dull days a little will be ſufficient; but if it is even a cold day, they ſhould have a little to rarefy the air, otherwiſe the fruit will not be good.

When the grapes are come to their ſize they may be kept pretty hot and cloſe, if they are wanted very early; by that management they will grow very large and fine to look at, but will not be ſo high-flavoured as when they have leſs heat and more air.

When the fruit is in bloſſom they ſhould have no water; and the place kept as dry as poſſible, for they are then in the moſt critical ſituation, as they at that time receive great quantities of the ſteam (if there is any) that riſes when the glaſſes are ſhut; ſo if great care is not taken, many of them will drop off; to prevent which, if two or three little holes were made in the back-wall with ſhutters, they might be opened in the night when the fruit was in bloſſom, and it would keep the place quite dry.

When glaſſes are uſed for grapes on fire-walls, and the fruit is not required early, there ſhould be two lengths, which will be

be ſufficient to make a regular ſucceſſion. The frames and glaſſes ſhould be moveable; and thoſe that were forced with glaſſes, if properly managed according to what has been directed, will be little worſe.

As ſoon as the fruit is gone the glaſſes ſhould be removed, and the Vines cut, which will be about the beginning of September, when they ſhould be nailed, and the border dreſſed.

Those Vines that had glaſſes over them laſt year, and are to be this year without, ſhould have fire put to them any time between the 25th of March and the 1ſt of May, and in every reſpect managed as directed for fire-walls without glaſſes.

By this means there will be as good a crop this year as if there had been no glaſſes the year before, and the Vines will be very fit for glaſſes the next ſpring; and thoſe which are forced by fire only this year,

year, will gain ſtrength if they were any ways drawn: they will alſo ſucceed thoſe under the glaſſes, and there will be a ſufficient quantity to ſupply a moderate family from the middle of June to the end of October.

I HAVE had ſeveral crops of fine grapes by the following method: I applied the fire to the wall the 1ſt of April, and worked it to the end of May without glaſſes, in the ſame manner as if there had been no glaſſes intended. At that time, the grapes being juſt out of bloſſom, I put on the glaſſes, and managed them in the ſame manner as I have directed for Vines under glaſs, and had very fine crops. The berries were very large, the fruit had a much finer flavour than thoſe that had the glaſſes put over them ſooner, and were ripe the latter end of July.

PROPER heat and air are the only things to be conſidered to render fruit of a good flavour; and unleſs theſe two elements are uſed properly, grapes will never be good:

good: they may be obtained early by the ſtrength of heat, and by a large quantity of water they may be ſwelled to a large ſize, but they will be inſipid.

A FINE large cluſter of grapes makes a fine appearance when the berries are plump and large; but in eating they taſte flat, and have no flavour, which is a great diſappointment; but thoſe who follow the directions here given with accuracy, will obtain fruit rich and good, which cannot fail to give both ſatisfaction and pleaſure.

THE directions for the management of grapes on fire-walls forced early, and thoſe forced late, may ſeem much the ſame; but when compared they will be found very different. The wood of the firſt will be much weakened by having early fruit, which it is impoſſible to prevent, as the inclemency of the weather in the winter months will not permit giving them ſufficient air to keep the wood ſtrong; ſo that the management of them next ſeaſon (although fire is requiſite) is not with

regard

regard to fruit, but to recruit the wood, and make it fit for forcing early the next year with glaſſes; whereas thoſe that are not forced early will have a good crop under the glaſſes, for at that ſeaſon proper air may be given to keep the wood in good order.

THE year following there may be as good a crop as if there had been no glaſs over them the preceding year. As to the forcing of the young Vines that were raiſed in the hot-bed of tanner's bark, it was only to encourage their growth, as it is directed to be done with moderation, although, at the ſame time, there will be a good deal of fruit.

GRAPES may be forced with paper covers inſtead of glaſs; and if the wall be lighted the beginning of April, and worked, as if no covers were intended, to the beginning or middle of May, they will anſwer very well and bring the fruit forward; but when they are uſed early they are liable to many misfortunes from the weather; and in a ſtormy night of

wind and froſt, if the covers are torn (which ſometimes happens) much damage may be done to the crop.

FRUIT raiſed under paper covers are not ſo high-flavoured as when under glaſs, and by the faintneſs of their light they draw and tender the trees much more, eſpecially in dull days, when much air cannot be given.

HAVING treated fully of fire-walls with and without glaſſes, I now proceed to hot-houſes built on purpoſe for vines, called Vineries.

THERE are many ſorts and forms of Vineries which bring good crops of fruit. Some of them have the Vines planted on borders in the houſe, and many are planted on the outſide, and taken in at holes left for that purpoſe.

IF the houſe is intended to have grapes very early, it is beſt to have the Vines planted on a border in the houſe: if for a large crop, and of a good flavour, they are beſt planted on a border on the outſide,

for there the roots have the advantage of ſun, air, and natural rains, which is much better than any artificial waterings, although ever ſo ſkilfully performed.

A VINERY built on purpoſe ſhould have no tan-pit, although many hold it beſt, as it gives a natural moiſt heat, which is by ſome ſaid to be better than the dry ſcorching heat produced by fire.

A SOFT moiſt heat is beſt for all kinds of fruit in the open air; but is not ſo where the air is confined, for many reaſons too numerous to mention, ſo ſhall only take notice of two.

IF there ſhould be a great heat in the bark when the vines are in bloſſom, the ſteam that riſes from it cauſes many of them to drop off. When the bark has loſt its heat at top, which it ſoon does, it muſt be often ſtirred up, which cauſes a very bad ſmell, and a great ſteam riſes, if it is freſh and hot; if there is not much heat, it has a muſty ſmell, which will infect the fruit, unleſs there are air-holes to

carry off the ſteam at night when the houſe is ſhut up; if that be the caſe, the moiſt heat of the bark is loſt, therefore would be better without it.

A GOOD Vinery ſhould be all flagged, and the flues ſo conſtructed that they may give a good deal of heat with little fire. There ſhould be a flue all round the houſe, which ſhould ſtand above the level of the floor, and as there is no tan-pit, it ſhould ſtand off the walls at leaſt two feet, that the heat may be equal on both ſides, which it cannot be when cloſe to, or in the wall. There might be a ſingle flue all along the middle of the floor, and one in the back wall, independent of each other. A little fire will keep a houſe warm if thus conſtructed.

A HOUSE built after this method might have the border made between the flue and the foreſide of the houſe thus: A brick of breadth laid a foot from the flue and raiſed one foot, the other foot ſunk; ſo that the top of the flue, which ſhould be two

two feet high, would be a foot higher than the ſurface of the border. The foreſide wall of the houſe ſhould be built on arches ſupported by ſmall pillars (which there would be no difficulty in doing, as there is no flue in the foreſide) ſo that the roots of the Vines might have liberty to ſtrike into the border on the outſide, which might be made ten feet broad. The arches ſhould be all ſo low that their tops may be within the border.

THE Vines ſhould be planted on the inſide of the border, a foot from the brick that ſupports the mould, by which means the roots would ſoon be without the houſe, and have all the advantages of free air and proper moiſture, and at the ſame time would be ſecure from the froſts affecting them, if they were forced early. If they are thus prepared and planted they would bear forcing much earlier.

IT will be neceſſary to have a ſhed at the back of the houſe, into which there ſhould be a door for a paſſage in very cold

weather, and to give air in hard frosts when forced early. It would also be very beneficial to have three air-holes in the back-wall above the flue, to carry off the great heat in very hot days when the glasses are opened; and there should be a door at each end of the house for the convenience of passing.

The frame for supporting the Vines should be at least two feet from the glass, which is much better than when it is nearer; for when they are too close to the glasses, it is impossible, in very hot days, to prevent the sun from burning the leaves and scorching the fruit; besides they have a free air when distant from the glass, ripen much better, and are not so subject to rot.

The frame should have the same slope with the glasses, that the Vines may be all of an equal distance from it. There should be no glass in front; and indeed there will be little room for any, if the house is built as directed.

The

The Vines may be trained ſtraight up in front like an eſpalier, until they are at a proper diſtance from the glaſs where the frame is fixed.

If the Vines are forced very early, it will be proper to cover the border on the outſide of the houſe four or five inches thick with long dung, ſtraw, moſs, or any ſuch light covering, which will keep the froſt from penetrating to the roots, and there will be a free communication with the plants in the houſe and the roots on the outſide.

It muſt be remembered that all Vines ſhould be planted in the ſame manner that was directed for the firſt againſt fire-walls, that their roots may run horizontally, and with the ſame compound; and that the ſide-branches every where ſhould be pinched off at a joint above the eye, as before directed.

If this houſe is planted with plants raiſed in heat, they ſhould be managed and planted in the ſame manner, and at

the ſame time, with thoſe under glaſſes on fire-walls; only with this ſmall difference, that in the pruning the firſt plant ſhould be cut to one eye; the next to ten or fifteen, if ſtrong; the next to four eyes; and ſo on to the end; that is, one, ten, four.

THE reaſon for this difference in pruning is, that here they may be managed ſo as to grow much ſtronger than on a common fire-wall; they have alſo much further to run, ſo that the houſe ſhould be furniſhed as ſoon as poſſible, to keep good wood in all parts of it.

IT would be of great ſervice to the Vines to take the glaſſes off the houſe as ſoon as the fruit is gone; but this ſhould be done with care, as they ſhould be hardened gradually, which may be done before the fruit is all gathered; for, after the grapes are all cleared for ripening, there will be no occaſion for much heat, ſo that they may have air night and day.

WHEN the leaves begin to grow yellow

low they ſhould be pruned, faſtened to the frame, and the glaſſes put on before the hard froſts and heavy ſnows fall; for, as they are not perpendicular, the froſt and ſnow would hurt them; nevertheleſs they ſhould have free air night and day until the heat is applied.

THE next ſpring the ſhoot that was cut to ten eyes ſhould have the bottom eye and the tenth encouraged for next year's young wood; and as there will be eight eyes between them which may have fruit, they muſt be topped two joints above the cluſter. That which was cut to four eyes ſhould have the fourth encouraged for young wood; and if the other three have fruit they muſt be topped as before; but if any of them, or thoſe on the long ſhoot, are barren, pull them off, and ſtop the hole with clay, as before. The ſhoot that was cut to one eye will be very ſtrong, and run to the backſide of the houſe.

THE next pruning ſeaſon the ſtrong ſhoot from one eye ſhould be cut to the

whole breadth of the houſe, and it will be full of bearing wood; the ſhoot from the top of the plant that was before cut to four eyes ſhould be cut to reach the middle of the houſe, and the bottom branches to four, five, and ſix eyes, as they are of ſtrength.

Now the whole frame is covered, there muſt be young wood left regularly all over at proper diſtances, as before directed, and at the pruning ſeaſon ſhortened as they are of ſtrength.

A HOUSE for Vines built after this manner is much better for forcing early than a common fire-wall, as there is proper conveniency to give warm air in very hard froſts, and in the very dampeſt weather it may be kept perfectly dry; for, when there is a long time of dull, damp, rainy weather, it is very difficult to keep the fruit on a fire-wall from moulding without over-heating the wall, which has often been the deſtruction of both vines and fruit.

IN

In the cold winter months, when the forcing is begun, the fires ſhould be made very moderately at firſt, and have a good deal of air in the day, and a little at night, for ſome time; for unleſs the buds puſh ſtrong at firſt there are little hopes of a good crop.

A week after the fires are made, it will be proper to give a little water to that part of the border which is within the houſe once a-week, and it ſhould be kept juſt moiſt at all times when the glaſſes are on the houſe, although there is no fire; otherwiſe the roots will decay.

After the fruit is out of bloſſom, and about the largeneſs of a ſmall pin's head, it will add greatly to the ſize of the fruit to ſprinkle all the floor over in the evening in fine weather, and ſhut up the houſe directly, which will cauſe a fine moiſture like a dew; but care muſt be taken to give air early in the morning to dry both fruit and leaves before the ſun begins to ſhine hot upon them, or it will burn the leaves and ſcorch the fruit.

It will be of great advantage to the fruit to give the border a good watering every week after it is out of bloſſom, until it is full grown; after which they ſhould have none, neither ſhould the floor be any more ſprinkled, but kept quite dry, and have a good deal of air, which will make the fruit of a much better flavour than when they are kept very hot, but they will not be ſo early by ten days. After they are full grown the air ſhould be admitted gradually; for if there be too much given at firſt, ſo as to check the growth of the Vines, it quite ſpoils the flavour of the grapes; and this is the reaſon why fruit that is forced under glaſs ſhould never have them taken away until all is gathered.

Great care ſhould be taken not to draw the Vines weak; for if they are, there is no other remedy to recover them but a year's reſt; that is, they muſt be all cut very ſhort, and have no fire put to them before the beginning of May; and then it muſt be moderate, and have a great deal of air.

It will be of great ſervice to ſprinkle the floor often to encourage the young ſhoots; they ſhould alſo have a great deal of water on the border, both on the outſide and inſide of the houſe, as it is not the fruit which is to be regarded this ſeaſon, but the ſtrengthening of the Vines for another year.

It will be a great diſappointment to a gentleman to have few or no grapes for a whole year, who had great plenty the ſeaſon before; and as every gardener that has the leaſt knowledge of plants muſt ſee when they are drawn weak, as ſoon as that is viſible he ſhould give more air and leſs heat, but this muſt be cautiouſly performed; for if, from a great heat and little air, the ſyſtem was to be changed to the other extreme, it would check the growth of the plants, and not only ſpoil the next year's wood, but the fruit of this year alſo.

There are few gentlemen that will be at the expence of having two ſuch houſes. If the vines are forced early one year with care, and the next year not until the beginning

beginning of May, as the plants would laſt many years, and bring good crops every year; becauſe at that ſeaſon the weather is fine, and they may have a great quantity of air to ſtrengthen them; for, as I ſaid before, it is impoſſible to force very early without drawing the plants.

VINES in ſuch houſes are ſubject to puſh out many ſhoots from the old wood, which ſhould be conſtantly rubbed off: they alſo puſh roots, which ſhould be taken off as ſoon as they appear.

GRAPES in a hot-houſe that is uſed for Pines in general appear large and fine to the eye, but are moſtly inferior in flavour to thoſe on hot-walls, with or without glaſſes, as they cannot be managed as they ought to be, the Pines requiring a very different culture, and being the principal crop. There ſhould be a good border made in the front, on the outſide of the houſe, of the ſame materials as before directed, which ſhould be four inches lower than the level of the ground, except a foot next th

the wall where the Vines are planted, which need not be above an inch. When they are all planted, cover all the border with gravel or ſand, ſo that the walk before the ſtove may be neat and clean.

If they are plants raiſed in heat, which are the propereſt, plant them four inches from the front wall of the ſtove, in the ſame manner as they are planted in all other places. Where Vines are intended in a Pine-ſtove, there ſhould be a round hole left againſt every rafter when the houſe is building, and the Vines ſhould be introduced into the houſe as ſoon as they are planted, and they will grow a great length the ſame ſeaſon, be very ſtrong, and will bear many grapes the next year.

There ſhould be no more than one plant to a rafter, which ſhould be cut to a great length when they are pruned; for they will be very ſtrong, and will produce fruit at almoſt every eye; but thoſe branches that do not bear ſhould be pulled off.

THERE ſhould be a ſtrong ſhoot trained as near the bottom as poſſible every year, and the laſt year's bearing branch cut entirely off. There can be no other management of Vines in a Pine-ſtove than to keep them clear of all ſide-branches, and to top the bearing ſhoots at two joints above the fruit; for regard muſt be had to the Pines, and not the Vines; ſo that ſometimes a ſmall accident deſtroys a crop that had a fine appearance.

As ſoon as the Vines in a hot-houſe begin to puſh, all the ſtem that is on the outſide of the houſe muſt be guarded from froſt; for one night's hard froſt, after the buds are broken, will deſtroy all the fruit for that year.

CLEAN moſs, free of graſs and mould, is the beſt thing I know for that uſe. It muſt be three inches thick all round the ſtem, and faſtened very cloſe.

GRAPES that grow very cloſe in the cluſter are not fit for hot-houſes, for there is often a great ſteam riſes from the bark when

when in proper order for the Pines, ſo that the moiſture, in dull weather, is not dried up for ſeveral days: when the grapes are near ripe, in ſuch weather they often rot, if they are cloſe in the cluſter.

When the grapes grow very cloſe, the cluſters ſhould be thinned when they are very young, and thoſe left will grow much larger, and not be ſo liable to rot. The large ſorts that hang looſe are the propereſt for Pine-ſtoves. This work ſhould be performed in the morning, when there is an appearance of a fine day, that the wounds may be dried before night by the heat of the ſun. This ſhould be performed with ſharp-pointed ſciſſors, and great care taken not to wound any of the berries that are left.

Those that uſe covers for their Pine-ſtoves are in no great danger of having their grapes hurt by froſts; but they are liable to be ſcorched by the ſun when they are cloſe to the rafters. The covering of ſtoves is attended with many inconveniencies, ſuch as breaking of glaſs in high winds,

winds, let the covers be of what ſort they will; in wet weather, in treading the ſand or gravel into a quagmire; and in very hard froſts, when the covers cannot be taken off for ſeveral days: in that time, perhaps ſome hours of ſun every day is entirely loſt, alſo the expence of time in covering and uncovering. All theſe things render it very troubleſome.

I HAVE not uſed a cover for a Pine-ſtove theſe thirty years, although I have had them under my care part of that time, even in the north of Scotland. There is no difficulty in keeping Pine-ſtoves without covers where there are no grapes; but as they are now introduced into almoſt every houſe, it is neceſſary to know how to manage them without being at the trouble of covering.

THERE are few ſtoves for Pines but where the plants ſtand at four or five feet from the glaſs. Fix iron pins of a foot long three or four in a rafter, according to the breadth

breadth of the houſe: there muſt be an eye of an inch ſquare at the end of each pin, through which place a rod to faſten the Vine; it will then be ſo far from the glaſs as to prevent the froſts hurting the grapes, and they will have a freedom of air, and not be ſubject to rot.

THE Vines hanging thus lower will be no detriment to the Pines, although it will ſhade them a little; but as it is in the ſummer months it will be no diſadvantage, as at that ſeaſon there is ſun and heat ſufficient, although a little ſhaded by the leaves of the Vines, and they will be all off before the autumn when ſun is wanted. If they have not dropped, they may be pulled off without any injury to the Vine.

GRAPES in Pine-ſtoves are for the moſt part planted promiſcuouſly of early and late ſorts; the early have in general their berries much cloſer in the cluſter than the late, and are not ſo fit for the hot-houſe.

If the large late kinds are taken into the hot-houſe, they are much higher flavoured than thoſe that ripen ſoon; for as they puſh much later than the early ſorts, the Pines are put into their proper order for the ſummer long before the grapes are of any ſize; ſo that there will be little or no ſteam until the autumn, when the grapes will be moſtly ripe.

As the weather in the ſummer is warm, the Pine-houſe has a great deal of air, and conſequently the grapes will be much richer; and as there is no long continuance of damp weather at that ſeaſon, they will not be ſo ſubject to rot; there will be this advantage alſo, although they are late in ripening, they will be of no additional expence.

The fire-wall may be forced to bring much earlier fruit than the plants in the Pine-ſtove; for the Vines that are in it will not puſh early, unleſs they are taken out of the ſtove as ſoon as the fruit is gathered

gathered (which is very troubleſome, and the Vines are in danger of being hurt) and kept out ſome time; as ſoon as they are put in again they will puſh, but it will be difficult to keep the froſt from the roots if they are put in early.

If the Vines are planted in the inſide of the Pine-ſtove they will puſh ſoon and be early; but it is not a good method, for there they can have no water but artificial waterings; and although it is done with judgment and care, it is far inferior to natural rains which ſupply them in winter. When in the inſide of the ſtove they muſt be kept damp when they are not growing, or the roots will mould and decay.

If the fire-walls are properly built they ſhould be fifty feet long for Vines to one fire, which ſhould be in the middle, draw both ways, and have dampers ſo as to throw all the heat one way or both, as ſhall be neceſſary. One ſide may be planted with the early kinds, and the other with a later ſort, that will ripen on

fire-walls without glaſſes. As they will be every other year without covers, it would be wrong to plant them with any Vines that will not ripen without glaſſes.

The ſide that has the early Vines may be forced early (two months) before the others, for it will be no detriment to them, as all the heat may be kept from the ſide that is not covered by the damper. It will be much better for the late Vines not to force them before the beginning of March, as then there will be more certainty of a crop, and the fruit will be much better.

To have a regular ſucceſſion for forcing, there ſhould be two lengths of fire-wall in Vines, and one half of each length planted with the early ſorts, and the other half with late.

If the early ſorts are forced to bear very early, the glaſſes may then be put on the other ſide, and all the heat thrown that way. If it is a cold wet ſeaſon it will be of great ſervice.

THE black, red, white, and brown Frontiniacs are all very fit for a hot-houſe, having full as high a flavour as when on an open wall with fire; the pores of the berries are much cloſer, and do not admit of ſo much of the ſteam when the houſe is ſhut up at night as moſt of the other ſorts of grapes; they never ripen equally without glaſs, and I have had them in greater perfection in Pine-ſtoves than I could ever bring them to on fire-walls amongſt other Vines. They all grow very cloſe in the cluſter, ſo ſhould be thinned, as before directed, when very young, which adds to their fragrancy, as then the ſun gets to all parts of the berries. The red Frontiniac is the higheſt flavoured, and the moſt eſteemed of any known in England.

THE Tokay is an exceeding good grape for the hot-houſe: it is the only proper place for it, as it is ſo long in ripening after the other ſorts, that it would cauſe the fire and glaſſes to be kept on at leaſt a month

month longer, which would be a detriment to the other plants; and, beſides the expence, they will not come to perfection without glaſs, ſo are not fit to be planted where there is not a conſtant cover.

THE brown Hamburgh is a fine large grape, and grows to a great weight, even four, five, and ſometimes ſix pounds a cluſter; but it is not of ſo high a flavour as thoſe already mentioned, yet is a good fruit.

THE Burlake is a fine large grape, and fit for the Pine-ſtove. It ripens very late.

THE Raiſin Grape grows to large cluſters; the berries alſo are very large. It ripens the lateſt of all the grape kinds, will hang long on the Vine, and after it is cut may be kept a month in a dry place where there is a good deal of air.

THERE are ſome other ſorts that will anſwer very well for the Pine-ſtove; but

thoſe

thoſe here mentioned are the beſt, and will be ſufficient to ſupply the table a long time after all thoſe on the fire-walls are gone.

THE following grapes ripen on fire-walls with or without glaſs, but are not fit for forcing early: red, royal, and black Muſcadines; white, red, and black Frontiniac; black Sweet-water, black Hamburgh; all theſe are fit to plant on one ſide of the fire-wall, to be forced alternately with or without glaſs; and that year the glaſſes are uſed, if you begin about the beginning of March, the grapes will be ripe in July.

THE year the glaſſes are not uſed, the middle or end of April is time enough to put fire to them, and then both ſides may be worked together. The early ſorts will be ripe the middle of July, and the late will be all finiſhed by the beginning of October.

IT will be proper to plant the following grapes on fire-walls by themſelves, and they may be forced every other year early, ſo as to be ripe the beginning of May; the Sweet-water, brick-coloured Grape, black Cluſter, white Muſcadine, and the Miller's Grape; many others will anſwer as well, and perhaps much better, than thoſe here mentioned, but I have not had them under my care.

I SHALL not mention any other ſorts of Vines, as I do not copy from any book, but only relate what has ſucceeded under my own immediate direction.

THE laſt-mentioned grapes will all ripen on common walls in the ſouth of England, and come to perfection.

END of VOL. I.

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